MORGAN COUNTY
HAZARD MITIGATION PLAN

Morgan County, West Virginia

August, 2003

Updated: July, 2009

The April 2009 updated version of the *Morgan County, West Virginia Hazard Mitigation Plan* has been reformatted for easier review utilizing the July 1, 2008 version of the FEMA *Local Mitigation Plan Review Crosswalk*. The section labels of the Plan contain the whole or truncated descriptions of each requirement and their respective regulations' identifications.

Morgan County Hazard Mitigation Plan

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(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

201.6(c)(1): The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

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ASSESSING VULNERABILITY: OVERVIEW

201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

A risk assessment profiling of hazard types determined that the following hazard types have an extremely low probability of occurrence within Morgan County, and that these types of hazards have been classified as non-realistic threats to the public, structures, and environment in Morgan County:

Avalanche
Coastal Erosion
Coastal Storm
Earthquake
Expansive Soils
Levee Failure
Land Subsidence
Tsunami
Volcano

Earthquakes and volcano eruptions could possibly affect Morgan County, even though they most likely would be centered at a significant distance away from any point within Morgan County. But, the probability of either hazard is still extremely low, even from significant distances.

Risk assessments profiling of the following hazard types determined that varying degrees of vulnerability to the public, structures, and environment in Morgan County have historically occurred, or are realistically possible, or indeed even probable, in the future. These are listed in the order of highest probability to the lowest probability of actual historical and/or future occurrences:

Wildfire
Windstorm
Flood (Flash and Widespread)
Hurricane (Tropical Storm Remnants)
Severe Winter Storm (Including Extreme Icing)
Drought (Including Public Water Supply Issues)
Hailstorm
Tornado
Landslide
Dam Failure

Dozens of wildfires occur each year within Morgan County. Most of them are contained to less than one acre in size. Approximately 5-10 wildfires occur each in the 5-

20 acres size range. The explosive growth of residential structures throughout the County during the last two decades has exponentially increased the vulnerability of major economic losses due to a large wildfire.

Significant windstorms occur in Morgan County resulting in damages primarily from straight-line winds and/or thunderstorm microburst downdrafts. Most damages are the result of downed trees into structures or power lines.

Flash flooding typically occurs from thunderstorm deluges. The primary area vulnerable to flash flooding is the Warm Springs Run watershed that flows through the Town of Bath (Berkeley Springs PO) and the most densely developed area of the County along the US Route 522 corridor. Widespread flooding damages have been diminished since a flood plain ordinance was enacted after the 1985 flood. But, if the widespread flooding reaches above the 100-year flood plain (FIRM areas), then significant damage could occur within the Town of Paw Paw and also along the Cacapon River.

The probability of a hurricane directly striking Morgan County is very low. However, Morgan County has experienced the tropical storm remnants of hurricanes. Varying degrees of damage has been experienced primarily from the winds, and some area wide flooding has occurred. Morgan County averages a tropical storm event about once every five years.

Severe winter storms have affected Morgan County primarily through the depth and drifting of snowfall. The most vulnerable impact from a winter storm would result from major ice accumulations that could destroy major portions of the electric and telephone infrastructure.

Serious drought conditions would seriously affect the farming operations throughout the County, and also dramatically increase the potential for major wildfires. However, the most vulnerability to drought is the impact to water supplies of the public water systems.

Significant hailstorm events occur about once per decade at various locations throughout the County. Major damage rarely occurs from these hailstorm events, usually occurring during severe thunderstorms.

Morgan County has officially incurred two tornado events during the past several decades. All areas of the County are equally vulnerable.

While landslides could occur on most of the numerous slopes throughout the County, the most vulnerable areas to significant impacts resulting from landslides would affect WV State Route 9 between Berkeley Springs and Great Cacapon, and also north of the Largent area near Claybaugh Rocks.

Metropolitan Berkeley Springs and the Warm Springs watershed are the most vulnerable to dam failure as eight flood control dams constructed in the 1950’s are

upstream from the most densely developed area along US Route 522 and the Town of Bath (Berkeley Springs PO).

PREREQISITES(S)

1. ADOPTION BY THE LOCAL GOVERNING BODY

201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan.

The *Morgan County Hazard Mitigation Plan* was developed as a multi jurisdictional plan. To meet the requirements of Section 322, the final plan was adopted by each of the incorporated municipalities as well as the county.

2. MULTI-JURISDICTIONAL PLAN ADOPTION

201.6(c)(5): For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

The plan was adopted by the following jurisdictions:
Morgan County
Town of Bath
Town of Paw Paw

See Appendix J. (Photocopies of Resolutions)

3. MULTI-JURISDICTIONAL PLANNING PARTICIPATION

201.6(a)(3): Multi-jurisdictional plans [e.g., watershed plans] may be accepted, as appropriate, as long as each jurisdiction has participated in the process. Statewide plans will not be accepted as multi-jurisdictional plans.

Agencies that participated in planning process:

Morgan County Commission
Morgan County Planning Commission
Town of Bath
Town of Paw Paw
Eastern Panhandle Conservation District
Morgan County Office of Emergency Services
Local Emergency Planning Committee

Volunteers from each participating jurisdiction served on the Core Planning Team. Data obtained through the use of the internet, local newspaper information, county files and

existing plans information was compiled for the risk assessment. The Core Planning Team used the documentation compiled for the risk assessment to generate mitigation goals objectives and strategies. For this phase of the project, the planning team met to discuss baseline strategies and actions to be taken to meet these goals.

PLANNING PROCESS

201.6(b): An open public involvement process is essential to the development of an effective plan.

The planning process utilized in Morgan County was based on Section 322 local planning requirements of the *Disaster Mitigation Act of 2000* supporting documentation developed by FEMA and the West Virginia Division of Homeland Security & Emergency Management (DHS&EM) and the Region IX Planning and Development Office. The planning process included the following steps, which will be described in further detail throughout the mitigation plan.

1. Establish a Core Planning Team
2. Perform a Risk Assessment
3. Develop a Capabilities Assessment
4. Develop Mitigation strategies
5. Adoption and implementation of plan.

Overview of Planning Process

- Establish a Core Planning Team consisting of volunteers from the above mentioned agencies and jurisdictions.
- Identify hazards specific to Morgan County and develop a hazard analysis for these hazards.
- Assess the risks and vulnerability to develop a mitigation strategy.
- Assess capabilities to evaluate the county's existing plans already in place adequately support mitigation strategies.
- Develop a mitigation strategy to include possible mitigation goals and actions and prioritize these goals.
- Develop a monitoring process to ensure the success of the mitigation plan as a whole.

The county's Core Planning Team consisted of the following members:

Robert Ford, Morgan County Commission
Bill Clark, Administrator, Morgan County Commission
Alma E. Gorse, County Planner. Morgan County Planning Commission
Susan Webster, Mayor, Town of Bath
Julie Kidwell, Town Clerk, Town of Paw Paw
Don Dirting, Eastern Panhandle Conservation District

David A. Michael, Director, Morgan County Office of Emergency Services
Several members of the Morgan County Local Emergency Planning Committee also contributed to the creation of this plan.

David Michael served as the Core Team Chairperson.

Two public meetings were held throughout the plan creation process. These meetings were held at different stages on the planning process. The first was held during the creation of the risk assessment plan and to present our draft review work. The second was during the mitigation strategies portion of the plan. Each of these meetings was advertised in our local paper, *The Morgan Messenger*. Our local paper also wrote news articles regarding the plan and its creation progress. Copies of the draft plan were available at the Morgan County Commission Office for anyone interested in reviewing. A similar process was performed for updating the plan by having representatives from Morgan County Office of Emergency Services, Morgan County Planning Office, other county and municipal representatives participate in the planning process. Once again, articles and advertisements were placed in our local paper to encourage public participation.

Public Meetings and Forums held:

March 6, 2003 – Public forum held at the Morgan County Commission meeting room to solicit comments and recommendations for the draft mitigation plan. (See sign in sheet from meeting in Appendix L)

April 17, 2003 – Risk Assessment and Mitigation Plan Public Forum held at the Morgan County Commission meeting room to solicit comments and/or recommendations on the draft Mitigation Plan. (See sign in sheet from meeting in Appendix L)

November 3, 2008 – Public Form to solicit comments and/or recommendations relating to the updating of the Mitigation Plan originally adopted in August, 2003. (See sign in sheet from meeting in Appendix L)

November 11, 2008 – Public forum to solicit comments and/or recommendations on draft updated Hazard Mitigation Plan. (See sign in sheet from meeting in Appendix L)

The citizens of Morgan County were informed about these meetings through various newspaper articles and public meeting ads. All these documents can be found in Appendix M.

Local, State and Federal agencies, local businesses, community leaders and other relevant private and nonprofit interest groups were given the opportunity to participate in the plan development in the same manner as the residents of Morgan County, through newspaper articles and public meeting announcements.

4. DOCUMENTATION OF THE PLANNING PROCESS

201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;

(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and non-profit interests to be involved in the planning process; and

(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

201.6(c)(1): The plan shall document the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Process of Creating and Updating the Plan:

The development of the Morgan County Hazard Mitigation Plan started primarily with the Office of Emergency Services Director, Planning Office staff and a few Local Emergency Planning Committee members. With assistance and guidance from the Morgan County Commission, a Core Team was created and work began on the plan. Because of the lack of volunteer assistance during this process, the Core Team, who most are already members of the LEPC, met at their meetings and created the draft document. Because these members consist of emergency services, planning, medical and environmental backgrounds, this provided a wide variety of input for the plan. These meetings were advertised via the news media and were all open to the public. The same process was used when updating the plan in 2008.

The public forum process was the mechanism used for public input and comments. Each incorporated jurisdiction aided with the creation and updating of the plan by supply data and historical information detrimental to the plan. The municipalities also received a copy of the draft document for review and comment prior to adoption.

The Local Emergency Planning Committee meetings were the primary source of data gathering, review of existing plans within the county and ultimately the creation and updating of the draft mitigation plan.

Members of the Core Planning Team each took a copy of the original plan to review and insert possible revisions. Every section of this plan was updated to meet the revised format and content requirements mandated by the State and FEMA.

The majority of the updates came from Core Team members David Michael, OES Director and Alma Gorse, County Planner and Floodplain Manager. Most of the revisions consisted of goals that had been accomplished through actions performed by the Planning Commission and the Office of Emergency Services. The updating of existing plans (i.e. planning ordinances, emergency operations plans) was an effective tool in improving the Hazard Mitigation Plan overall.

Review and incorporation of Existing Plans, Studies and Reports:

The capability assessment describes the legal authority vested in local governments to pursue measures to mitigate the impacts of natural hazards. This capability assessment focused in the evaluation of Morgan County's existing programs to determine what vehicles are already in place to support mitigation activities. The Hazard Mitigation Plan is an integral part of the continued review of the county's existing ordinances and plans. County staff and emergency personnel continue to review the plan's strategies and objectives to accomplish the established goals. A brief overview of existing plans and ordinances for the county and municipalities are referenced below.

Morgan County Flood Plain Area and Improvement Location Permit Ordinance

This ordinance was enacted in 1983and updated in March, 2009 for the primary purpose to;

- Promote the general health, welfare, and safety of the community;
- Encourage the utilization of appropriate construction practices in order to prevent or minimize flood damage in the future;
- Minimize danger to public health and safety by protecting water supply, sanitary sewage disposal and natural drainage;
- Reduce financial burdens imposed on the community, its governmental units and its residents by preventing the unwise design and construction of development in areas subject to flooding.

Effectiveness for Mitigation: High

This ordinance prohibits development that could increase the base flood elevation for flood prone properties. It established special design and construction standards that allows for elevation and flood proofing measures to be performed as long as base flood elevation is not increased. The ordinance also requires that improvement location permits be obtained for any type of construction or improvement within the county.

The Morgan County Planner served as a Core Team member and with assistance from the Morgan County Planning Commission, updated the Ordinance to enact further restriction of the floodway areas, implement an 18" freeboard on new residential construction and provide additional guidance to the public as to

what regulations and restrictions are in place within flood prone areas. Planning staff incorporated this data into the updating of the plan.

Morgan County Subdivision Regulations

This ordinance was enacted in 1983 for the purpose of:

- Assisting in orderly and efficient land development;
- Coordinate existing streets, roads and utilities with new streets, roads and utilities;
- Insure that roads are safe and adequate for the type of subdivision selected and that adequate provision has been made for road maintenance;
- Safeguard lives and property from loss of fire, flood, and erosion;
- Protect water supplies and other natural resources;
- Protect prospective purchasers of land in subdivisions
- Requires implementation of stormwater management practices for developments.

Effectiveness for Mitigation: Medium

The ordinance requires developers to identify flood prone areas to protect and inform potential buyers of the land. It also requires design and construction standards for storm water drainage that includes sediment and erosion control measures. The ordinance also requires setbacks to help prevent damages to utilities

The subdivision regulations were updated in 2008 and now reflect additional restrictions with development in the 100 year floodplain. The ordinance restricts developers to place building footprints within the 100 year floodplain. This reduces the placement of residential structures within harms way during flood events. This information was also supplied and supported by Planning Commission members and staff.

Morgan County Comprehensive Development Plan

The *Comprehensive Development Plan for Morgan County* was last updated in March of 2007. It provides essential information pertaining to topography, streams and rivers, land use groundwater recharge areas, and other types of information.

This information is used as a tool for reviewing and updating any existing and proposed ordinances for the county.

Effectiveness for Mitigation: Low

During the updating of the Comprehensive Plan, Planning Commission members and staff held several public forums and meetings to gather data and recommendations for the plan. This data was also essential to the updating of the

Mitigation Plan. This information was supplied and supported by the Planning Commission members and staff.

Morgan County Emergency Operations Plan

This plan predetermines, to the extent possible, actions to be taken by the responsible elements of the government of Morgan County and its municipalities, to prevent avoidable disasters, to establish capabilities for protecting citizens from the effects of disasters, to respond effectively to the actual occurrence of disasters, and to provide for recovery in the aftermath of an emergency.

The provisions of this plan apply to all types and causes of natural and man made emergencies. It is composed of a basic plan that provides general guidance, a series of general annexes that are applicable to all disaster operations, and a series of hazard specific annexes. It supports the emergency assistance objectives of and is in accordance with the West Virginia Emergency Disaster Plan and Federal Disaster Relief Act. The last update of the *Emergency Operations Plan* was completed in 2007.

Effectiveness for Mitigation: High

The Morgan County Emergency Services Director and staff supplied pertinent data to the Core Team for insertion into the Mitigation Plan.

Warm Springs Run Emergency Action Plan

Emergency Action Plans for each of the eight flood control structures associated with the Warm Springs Run watershed have been developed and submitted to the Dam Safety Division, Office of Water Resources, at the West Virginia Department of Environmental Protection in November 2002. The Office of the Eastern Panhandle Conservation District received a letter of acceptance and approval on January 29, 2003. These plans are designed to assist in the monitoring under various conditions and the notification of appropriate agencies if needed. These documents provide a plan for the coordination and implementation of needed emergency actions in the event of improper function or structural failure that may require the evacuation of down stream residents. While each plan consists of a standardized format, information regarding each structure and its impact upon the watershed and down stream residents/properties is customized for each sit.

Listing of information provided by the plan:

- Site description, locations and construction specifications regarding the structure, flood inundation maps, emergency site identification maps;
- Monitoring Plan and Inspection schedules both during normal and adverse conditions;
- The issuance of standby alerts and/or evacuation notifications to local governments and emergency service organizations;

- Identification and establishment of a central command post for the direction of emergency operations;
- General evacuation notice given and assistance provided for the rapid transport of evacuees to emergency shelters;
- Pre-identification and opening of emergency shelters for evacuees
- Coordination of search and rescue of isolated residents;
- The development of a directory containing related community government and local emergency service/organizations, which would be contacted for assistance during an emergency.

Effectiveness for Mitigation: High
The Morgan County Office of Emergency Services, Planning Commission Office and Town of Bath office staff have all reviewed and obtained copies of this plan. This information was provided for the mitigation plan.

Morgan County E-911 Ordinance

This ordinance allowed the establishment of a county answering point and an enhanced emergency telephone system which automatically connects the person dialing the primary emergency number to the county answering point, and in which the telephone network system automatically provides to personnel receiving the call, immediately upon answering the call, information on the location and the telephone number from which the call is being made, and upon direction from personnel receiving the call, routes such call to emergency service providers that serve the location from which the call is made. It has provided the assignment of names to streets and roadways and the implementation of posting street signs and building numbers to structures to promote the health, safety and welfare of citizens.

Effectiveness for Mitigation: Medium

During the updating of the mitigation plan, this data was readily available through OES personnel.

Contingency Plans for Privately Owned Dams

Each owner of a privately owned dam structure with an impoundment is requested by the West Virginia Department of Natural Resources to develop, maintain and implement a mitigation plan specific to each dam structure. Morgan County would follow these specific strategies.

Effectiveness of Mitigation: High

Periodic inspections are performed of these dams by OES personnel, conservation and watershed groups. This data was provided by the OES personnel for the insertion into the plan.

Town of Bath and Town of Paw Paw Ordinances

Both municipalities within Morgan County have adopted the Morgan County Improvement Location Permit and Flood Plain Ordinance to ensure continued compliance with the NFIP Program. Each municipality has their own permitting process for citizens within the municipality. Town officials and staff continually work with the Morgan County Flood Plain Manager regarding flood plain application reviews and permitting.

Effectiveness of Mitigation: High

Participation by the town's personnel was crucial during the creation and updating of the plan. County Planning staff obtained copies of these ordinances for review and insertion into the plan.

RISK ASSESSMENT

201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. The purpose of this risk assessment is to assist Morgan County and its incorporated municipalities in identifying and understanding their risks from natural disasters. This information will serve as the foundation for developing a countywide hazard mitigation plan that will include strategies to help reduce risks from future hazard events.

The risk assessment followed the methodology described in the FEMA publication 386-2 "Understanding Your Risks- Identifying Hazards and Estimation Losses" and was based on a four-step process:

1) Identify Hazards
2) Profile Hazard Events
3) Inventory Assets
4) Estimate Losses

Using FEMA guidance, as well as the Section 322 regulations, for developing local hazard mitigation plans, Region IX has developed a risk assessment that identifies:

- The hazards to which the county and its communities are susceptible
- The impact of these hazards on physical, social and economic asset
- The areas most vulnerable

- Potential costs of damages or costs avoided through future mitigation projects.

According to the State, Morgan County has 34 repetitive loss structures and the Town of Bath has one. The county will update the State as repetitive loss structures are mitigated.

5. IDENTIFYING HAZARDS

201.6(c)(2)(i): The risk assessment shall include a description of the type of all natural hazards that can affect the jurisdiction.

The first step in the risk assessment process is to identify each of the hazards that can occur within Morgan County and its incorporated municipalities. This hazard identification process began with a review of previous hazard events based on historical data provided by the Morgan County Office of Emergency Service Director, David A. Michael and the Morgan County Planner, Alma E. Gorse. Region IX also conducted a review of existing resources, plans, and reports provided by FEMA, Morgan County, and other sources to understand the nature and extent of natural and man made hazards in the community. The findings from these steps were utilized to determine the priority hazards for Morgan County and its municipalities, which will become the focus of the mitigation strategies developed in the remainder of this plan.

1. *Hazard History*

Past occurrences of hazard events are likely predictors of future events. A review of the hazard history of Morgan County, therefore, helps to provide a better understanding of the hazard vulnerability of the county. Below are summaries of the major events by hazard type based on information that was available at the time of this draft.

See Appendix I for complete list of hazards that have occurred as documented by NOAA.

<u>Flood</u>

The worst hazard events experienced in Morgan County were incidences of flooding resulting from heavy rains, snow melt, and coastal storms. Periodic flooding occurs along the Cacapon River, Sleepy Creek and the Potomac River. Prior to 1962, Town of Bath (Berkeley Springs) area experienced almost annual flooding from Warm Springs Run which caused serious flood damage to homes, business, streets and highways. The most damaging flood on record occurred in 1936. Another large flood occurred in 1954 and 1985, where both business and residences within the Town of Paw Paw were severely damaged.

In January of 1996 there was a three-day period of flooding resulting from snow melting after the blizzard of 1996. The flooding resulted in the cause of one death, property damage in the amount of $20,500,000, and crop damage in the amount of $150,000. The Town of Paw Paw was hardest hit by this flood, suffering the loss of its major industries (which were located in the floodplain).

In September of 1996, heavy rain and flooding was experienced as a result of Hurricane Fran. The flooding resulted in property damages in the amount of $500,000 and crop damages in the amount of $525,000.

Winter Storm

Severe winter storms are common in Morgan County, the Town of Bath and the Town of Paw Paw due to its extreme northeastern location and proximity to higher elevations. As a result of such storms power outages, felled trees, and blocked roadways are normal occurrences; and material damages are minimal. Out of 40 winter storms recorded over the past 53 years, only 4 have been identified as having significant financial impacts.

In November 1995 a winter storm generated heavy snows which cause $50,000 in property damage throughout the county.

On December 19, 1995 a winter storm generated heavy icing conditions resulting in $15,000 of property damage throughout the county.

A winter storm on February 4, 1998 caused $12,000 in property damage.

On January 14 1999, a winter storm generated heavy icing conditions resulting in $80,000 of property damages throughout the county.

Tornado/Wind Storm/Severe Thunderstorm

Morgan County has experienced high windstorms and severe thunderstorms with strong winds and lightening strikes that caused power outages, felled trees, and minor structural damage. Sixteen of the twenty-nine events recorded over the past 53 years have caused measurable financial damage to property.

- On March 6, 1997 a windstorm generated $30,000 in property damages across the county. Damage was widespread.
- On March 31, 1997 a windstorm generated $53,000 in property damages across the county. Damage was widespread.
- A thunderstorm on April 8, 2000 caused $100,000 of property damage in the Town of Bath.
- On June 16, 2000 a thunderstorm caused $75,000 of property damage in the unincorporated community of Great Cacapon.
- In September, 20040 a line of severe thunderstorms producing possible tornadoes or downbursts caused $300,000 of property damage in the Sleepy Creek District of the county (northeastern portion) due to Hurricane Isabel.

The updating of this section was provided by data available at the Morgan County E-911 Center and also from NOAA. Our Emergency Services Director was able to provide the necessary documentation. No new hazards were added and none were removed as a result of the updating of this plan.

6. PROFILING HAZARDS

201.6(c)(2)(i): The risk assessment shall include a description of the… location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Priority Hazards

The historical hazard information provided insight into some of the high priority hazards that should be included in the plan; however, it did not capture all of the possible hazard risks in the county and municipalities. An additional review of possible hazard risks was conducted using the resources provided in "Understanding Your Risks-Identifying Hazards and Estimating Losses" (FEMA 386-2).

The table below provides a summary of how the priority hazards were determined using a combination of historical occurrences, public perception of hazard risk, and the probability of future occurrence based on other resources (NWS, NOAA, USGS, etc.).

Table 1
Prioritization of Hazards for Morgan County

Hazard	Probability of Occurrence	Perception of Risk	Historic Occurrence	Sources
Thunderstorms and Lighting	M	M	Y	NWS/NOAA
Floods	M	H	Y	NWS/NOAA/USDA
Severe Winter Storms	H	M	Y	NWS/NOAA
Windstorms	M	M	Y	NWS/NOAA
Hurricane	N/A	N/A	N/A	N/A
Drought	M	L	Y	NWS/NOAA
Tornadoes	L	L	Y	NWS/NOAA
Hailstorms	L	L	Y	NWS/NOAA
Extreme Summer Heat	M	M	Y	NWS/NOAA
Wildfire Hazards	H	M	Y	WVDF/MCVFDs
Caves/Sinkholes	L	L	N	USGS/WVDNR

Urban Interface Fires	L	L	N	MCVFDs
Land Subsidence	L	L	N	USGS/WVDNR
Landsides	M	L	N	USGS/WVDNR
Earthquake	L	L	N	USGS/NWS/NOAA
Expansive Soils	L	L	N	USDA/WVDNR

Based on these findings, the following hazards were selected as priority natural hazards for Morgan County:
Floods
Severe Winter Storms
Severe Thunderstorms/Lightening
Wind Storms
Wildfires
Dam Failures

7. ASSESSING VULNERABILITY: OVERVIEW

201.6(c)(2)(ii): The risk assessment shall include a description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

A risk assessment profiling of hazard types determined that the following hazard types have an extremely low probability of occurrence within Morgan County, and that these types of hazards have been classified as non-realistic threats to the public, structures, and environment in Morgan County:

Avalanche
Coastal Erosion
Coastal Storm
Earthquake
Expansive Soils
Levee Failure
Land Subsidence
Tsunami
Volcano

Earthquakes and volcano eruptions could possibly affect Morgan County, even though they most likely would be centered at a significant distance away from any point within Morgan County. But, the probability of either hazard is still extremely low, even from significant distances.

Risk assessments profiling of the following hazard types determined that varying degrees of vulnerability to the public, structures, and environment in Morgan County

have historically occurred, or are realistically possible, or indeed even probable, in the future. These are listed in the order of highest probability to the lowest probability of actual historical and/or future occurrences:

Wildfire
Windstorm
Flood (Flash and Widespread)
Hurricane (Tropical Storm Remnants)
Severe Winter Storm (Including Extreme Icing)
Drought (Including Public Water Supply Issues)
Hailstorm
Tornado
Landslide
Dam Failure

Dozens of wildfires occur each year within Morgan County. Most of them are contained to less than one acre in size. Approximately 5-10 wildfires occur each in the 5-20 acres size range. The explosive growth of residential structures throughout the County during the last two decades has exponentially increased the vulnerability of major economic losses due to a large wildfire.

Significant windstorms occur in Morgan County resulting in damages primarily from straight-line winds and/or thunderstorm microburst downdrafts. Most damages are the result of downed trees into structures or power lines.

Flash flooding typically occurs from thunderstorm deluges. The primary area vulnerable to flash flooding is the Warm Springs Run watershed that flows through the Town of Bath (Berkeley Springs PO) and the most densely developed area of the County along the US Route 522 corridor. Widespread flooding damages have been diminished since a flood plain ordinance was enacted after the 1985 flood. But, if the widespread flooding reaches above the 100-year flood plain (FIRM areas), then significant damage could occur within the Town of Paw Paw and also along the Cacapon River.

The probability of a hurricane directly striking Morgan County is very low. However, Morgan County has experienced the tropical storm remnants of hurricanes. Varying degrees of damage has been experienced primarily from the winds, and some area wide flooding has occurred. Morgan County averages a tropical storm event about once every five years.

Severe winter storms have affected Morgan County primarily through the depth and drifting of snowfall. The most vulnerable impact from a winter storm would result from major ice accumulations that could destroy major portions of the electric and telephone infrastructure.

Serious drought conditions would seriously affect the farming operations throughout the County, and also dramatically increase the potential for major wildfires.

However, the most vulnerability to drought is the impact to water supplies of the public water systems.

Significant hailstorm events occur about once per decade at various locations throughout the County. Major damage rarely occurs from these hailstorm events, usually occurring during severe thunderstorms.

Morgan County has officially incurred two tornado events during the past several decades. All areas of the County are equally vulnerable.

While landslides could occur on most of the numerous slopes throughout the County, the most vulnerable areas to significant impacts resulting from landslides would affect WV State Route 9 between Berkeley Springs and Great Cacapon, and also north of the Largent area near Claybaugh Rocks.

Metropolitan Berkeley Springs and the Warm Springs watershed are the most vulnerable to dam failure as eight flood control dams constructed in the 1950's are upstream from the most densely developed area along US Route 522 and the Town of Bath (Berkeley Springs PO).

8. ASSESSING VULNERABILITY: ADDRESSING REPETITIVE LOSS PROPERTIES

201.6(c)(2)(ii): The risk assessment must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

To better prepare to handle flood damage, Morgan County and the two unincorporated municipalities of Bath and Paw Paw participate in the National Flood Insurance program (NFIP).

Currently, Morgan County enforces a Floodplain and Improvement Location Permit Ordinance requiring persons, partnerships, businesses and corporations to obtain an Improvement Location Permit for any development which includes man-made changes to improved or unimproved property, including but not limited to buildings or other structures, mining dredging, filling, grading,, paving, excavation or drilling operation or storage of equipment or materials. This Ordinance provides certain minimum standards for construction within a flood prone area and sets forth criteria for submission and approval of plans. It also establishes penalties for any persons who fail to comply with the requirements or provisions of the Ordinance.

The intent of the Ordinance is to promote the general health, welfare and safety of the community and encourage the utilization of appropriate construction practices in order to prevent or minimize flood damage in the future. The Flood Plain and Improvement Location Permit Ordinance was updated in March, 2009.

See attached Repetitive Loss Report for Morgan County in Appendix N and also refer to the NFIP Section of the Comprehensive Plan, Appendix P.

9. ASSESSING VULNERABILITY: IDENTIFYING STRUCTURES

201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

The second step in the risk assessment process is to create a profile of each of the priority hazards in Morgan County. This analysis assists in determining the potential damages in the county from natural hazards. This stage of the risk assessment was done through the employment of scoring matrix. Both recorded data and map presentation were utilized to assess the extent or dynamics of each hazard type might pose in the future. Although some maps relating to specific hazard conditions exist, the next planning stage (the "mitigation planning process") will generate a full range of current topical and analytical GIS maps for all of the hazard categories.

1. Hazards

Flooding

Flooding is defined as a general and temporary condition of partial or complete inundation of normally dry land areas from: the overflow of inland or tidal water; the unusual and rapid accumulation or runoff of surface waters from any source; or mudflows or the sudden collapse of shoreline land. Flooding is one of the highest priority natural hazards in Morgan County, however, its disaster level of occurrence and propensity of escalated damage costs justify its selection.

Within the county there are two major rivers, the Cacapon and the Potomac. Historically, several hundreds of cabins have been subject to flooding along the Cacapon River; but more recently, the development of permanent residences adjacent to the 100-year floodplain boundary increases vulnerability. Sleepy Creek floods periodically, although the intensity of farming is steadily decreasing along the stream's channel running within the county resulting in reduced flooding incidences. In Berkeley Springs, the Warm Springs Run watershed protection project has greatly reduced flood damages in the town and vicinity; however, some hazard still exists from rare, high-intensity storms. Moderate flooding problem areas run the full extent of the Potomac River through Morgan County with severe problem points emerging within and around the Town of Paw Paw, northeast of the confluence of the Cacapon River, and at the confluence of Sleepy Creek.

Identification of floodplain areas within the county and the incorporated municipalities was based on the most recent Flood Insurance Rate Maps (FIRM) produced by FEMA. The map titled "Morgan County Flood Areas" displays the locations of all of the major water bodies in the county and delineates the 100-year

floodplains, and the balance of the remaining delineated floodplains is within the County.

See Appendix A containing FIRM Map information.

Landslide

Landslides are defined as any downward movement of a slope and materials under the force of gravity. The term landslide includes a wide range of ground movement, such as rock falls, deep failure of slopes, and shallow debris flows. Landslides are influenced by human activity (mining and construction of buildings, railroads and highways.) and natural factors, (geology, precipitation, and topography). Landslides occur when masses of rock, earth, or debris move down a slope. Therefore, gravity acting on an overly steep slope is primary cause of a landslide. Storms, fires, or human modifications to the land typically activate landslides.

The majority of Morgan County is characterized as a medium landslide risk due to the amount of slope in the overall topography. The topography and underlying geology have the greatest influence as to whether a landslide will occur or not. Additional geotechnical studies outside the scope of this work would need to be conducted in order to identify more specific areas of landslide risk within the high-risk area. See Geological Map Appendix S.

Earthquake

An earthquake is a sudden motion or trembling that is caused by a release of strain accumulation within or along the edge of Earth's tectonic plates. The severity of these effects is dependent on the amount of energy released from the fault or epicenter. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and after just a few seconds can cause massive damage and extensive casualties. Common effects of earthquakes are ground motion and shaking, surface, fault ruptures, and ground failure.

Peak ground acceleration (PGA) is a measure of the strength of ground movements. The PGA measures the rate in change of motion relative to the established rate of acceleration due to gravity. Using the national map provided by the USGS that shows the PGA values for areas with a 10% chance of being exceeded over 50 years it was determined that the entire state of West Virginia has an earthquake risk, as it is located in the 3%g area. According the REMA areas with a 3%g PGA or more are considered to have a moderate to high earthquake hazard risk and should consider earthquake hazards when developing hazard mitigation plans.

As the entire state falls within the same PGA boundary, it is difficult to map the earthquake hazards using this information. Review of the USGS's "Geology Quadrangle" covering the Morgan County area provided the delineation of fault lines used to tentatively assess the earthquake risk level. In Morgan County the earthquake risk is relatively low compared to other portions of the state or event the county as well as the proximity of Morgan County to other areas of earthquake activity. The central and Southeast U.S. region covers a large area of relatively diffuse, low rate

seismically. Principal areas of activity include the New Madrid Seismic Zone, the East Tennessee and southern Appalachian Seismic Zones, and South Carolina. Earthquakes do occur throughout the entire region. These factors increase the likelihood of Morgan County experiencing an earthquake at some point in time even though there has not been any historical evidence of damaging earthquake activity occurring in the past. Earthquakes are so low a risk that we discontinue discussion for this type of hazard.

Land Subsidence

Land subsidence can be caused by natural processes, such as the dissolving of limestone underground, an earthquake, or volcanic activity. It can also be the result of human actions such as withdrawal of subsurface fluids or underground mining. In Morgan County the primary geology is sandstone and shale, resulting in the conclusion that land subsidence is not considered a normal or natural hazard threat and would be assigned a low risk classification and will not be considered a hazard in this plan.

Severe Winter Storm

Winter storms vary in size and strength and can be accompanied by strong winds that create blizzard conditions and dangerous wind chill. There are three categories of winter storms. A blizzard is the most dangerous of all winter storms. It combines, low temperatures, heavy snowfall, and winds of at least 35 miles per hour, reducing vulnerability to only a few yards. A heavy snowstorm occurs when snow drops at a rate of 4 or more inches in a 12-hour period. An ice storm occurs when moisture falls and freezes immediately upon impact. For the purposes of this risk assessment it is assumed that all of Morgan County is equally at risk from severe winter storm events.

Severe Thunderstorms/Lightning

A severe thunderstorm as defined by the National Weather Service is a storm with hail equal to or greater than ¾" in diameter or convective wind gusts equal to or greater than 58 mph. Lightening and general thunderstorm wind gusts pose a threat to life and/or property. Severe thunderstorms also have the potential of producing a tornado with little or no advanced tornado warning. Based on historical evidence it is assumed that all of Morgan County is equally at risk from severe thunderstorm events.

Windstorms

For the purpose of this risk assessment windstorms are destructive wind events that occur with or without the presence of other storm events such as tornadoes or severe thunderstorms. Localized geographic conditions can exacerbate the damages from high winds and cause increases in wind intensity. Morgan County has experienced high wind damages in the past and can expect wind-related problems in the future. This assessment assumes that the risks from high wind events are equally distributed throughout the county.

Tornado

A tornado is a violently rotating column of air extending from a thunderstorm to the ground. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 mph or more. Damage paths can be in excess of 1 mile wide and 50 miles long. Tornadoes are among the most unpredictable of weather phenomena. Tornadoes can occur in any state in the U.S. but are most frequent in the Midwest, Southeast, and Southwest.

The nature of tornadoes is they strike at random. While it is known that some areas of the country experience tornadoes more than others, predicting exactly what parts of Morgan County have a greater chance of bring struck by a tornado is difficult. The best predictor of future tornadoes is the occurrence of previous tornadoes. According to county records there has been only one recorded tornado event in Morgan County. This tornado was characterized as a F0 on the Fujita Tornado Measurement Scale (which categorized tornadoes based on wind speed and expected damages) and produced very localized damage to persons or properties within the county.

The Fujita scale provides us with an idea of the strength and extent of damages of tornadoes that can occur in Morgan County. An additional resource to help understand the extent of tornado risks is the "Design Wind Speed Map" developed by the American Society of Civil Engineers (ASCE). See Appendix R for map reference. According to this map the entire state of West Virginia is located in Zone III, whose area is associated with up to 200-mph wind speeds.

Drought

Drought refers to an extended period of deficient rainfall relative to the statistical mean for a region. Drought can be defined according to meteorological, hydrological, and agricultural criteria. Meteorological drought is qualified by any significant deficit of precipitation. Hydrological drought is manifest in noticeably reduced river and stream flows and critically low groundwater tables. The term agricultural drought indicates an extended dry period that results in crop stress and harvest reduction.

The Palmer Drought Severity Index (PDSI) is a widely used measure of drought in the United States to track moisture conditions. The PDSI is defined as "an interval of time, generally in months or years in duration, during which the actual moisture supply at the give place rather consistently falls short of the climatically expected or climactically appropriate moisture supply." The range of PDSI is from -4.0 (extremely dry) to plus 4.0 (excessively wet), with the central half (-2.0 to plus 2.0) representing the normal or near normal conditions.

For the purposes of this risk assessment it is assumed that Morgan County has a low drought risk, but a moderate probability of occurrence and significant economic damage. The risk of drought is equally distributed throughout the county.

Hailstorms

Hailstorms occur when freezing water in thunderstorm type clouds accumulates in layers around any icy core. Hail causes damage by battering crops, structures, automobiles and transportation systems. When hailstorms are large (especially when combined with high winds), damage can be extensive; however, due to the historic level of occurrences hailstorms are considered a low risk hazard in Morgan County and therefore will not be included in future updates of this plan.

Wildfires

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed and spread quickly and are usually signaled by dense smoke that fills the area for miles around. Natural occurring and non-native species of grasses, brush and trees fuel wildfires.

Wildfire maps do not show the extent or range of where a wildfire will occur because they are dependent on the amount of fuel available, weather conditions, and wind speed and direction. Based on available data at the local VFD and state (Fire Marshall and DNR) levels it is assumed that the entire county is at high risk from wildfires and will be considered as a county wide hazard.

Urban Fires

An urban fire is any instance of uncontrolled burning which results in major structural damage to residential, commercial, industrial, institutional, or other properties in developed areas. Municipalities with significant development in either a downtown area or and industrial park are prime targets for this type of occurrence. For the purposes of this risk assessment urban fire hazards will be considered low for the incorporated municipalities of the county and not included in this plan.

A critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in Morgan County, or fulfills important public safety, emergency response, and/or disaster recovery functions. Critical facilities are those facilities that are vital to the continued delivery of key government services or that may significantly affect the public's ability to recover from an emergency. Facilities critical to government response and recovery activities include: 911 centers, emergency operations centers, police and fire stations, public works facilities, water and sewer facilities, hospitals, bridges and roads and shelters.

In addition to response and recovery facilities, critical facilities may also include those tat provide essential services to a community such as churches, government buildings, schools and colleges.

Data from the Morgan County Office of Emergency Services was used to compile a list of critical facilities within the county. Refer to Critical Facilities Listing Appendix E.

10. ASSESSING VULNERABILITY: ESTIMATING POTENTIAL LOSSES

201.6(c)(2)(ii)(B): The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.

In order to assess where and to what extent the identified hazards will affect the assets of Morgan County, the locations of assets were identified and intersected with the hazards in GIS where applicable and available.

Of the 10 hazards identified as priority hazard, all can be considered countywide hazards. These are not site-specific and are assumed to occur on a countywide basis. For this reason, the inventorying of assets for these hazards can be considered the total assets for the county.

An ideal loss estimate would include values for property, contents and operations that are adjusted based on the estimated percent loss due to each hazard. As mentioned above, this step is not feasible at the time this plan was created and updated.

Due to very limited personnel at this time, losses for each hazard will be estimated in a revised version of this plan.

11. ASSESSING VULNERABILITY: ANALYZING DEVELOPMENTAL TRENDS

201.6(c)(2)(ii)C): The plan should describe the vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

An analysis of future development trends in relation to the identified hazard areas is a required component of the risk assessment according to the Section 322 regulations. This analysis is important to help Morgan County to reduce future vulnerabilities by understanding the risks associated with locating new developments in high hazard areas. This will also be useful in developing strategies to reduce or eliminate future vulnerabilities from identified hazards.

Morgan County has updated our Comprehensive Plan that was adopted by the Morgan County Commission in March, 2007 by the Morgan County Planning Commission and staff. This process took roughly two years and involved several public forums and meeting with various groups throughout the county. Planning staff submitted this document to the Core Team for review and submittal into the Hazard Mitigation Plan. The Plan includes current land use mapping along with updated demographic information about the county. This information has been integrated into our *Hazard Mitigation Plan*. Please see Appendix O for excerpts from the Land Use Section of the Comprehensive Plan.

12. MUTLI-JURISDICITIONAL RISK ASSESSMENT

201.6(c)(2)(iii): For multi-jurisdictional plans, the risk assessment must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

The vulnerability assessment takes the hazards profile information and combines it with community asset information to analyze and quantify potential damages from future hazard events. This process combines the final two steps of the risk assessment: the inventory of assets and the estimation of losses.

1. Asset Inventory

The asset inventory identifies critical infrastructure and facilities that can be damaged or affected by the hazard events. In order to assess where and to what extent the identified hazards will affect the assets of Morgan County, the locations of assets will be identified and incorporated in future GIS mapping programs related to mitigation planning process.

The asset inventory will integrate data provided from the E-911 database and maps created for the Morgan County E-911 readdressing project and variable layers from mapped records available in the County Assessors Office. The County Tax and 911 maps will be used as the base maps for making the completed risk assessment and comprehensive hazard mitigation plan. The majority of structures vulnerable to risk within the county are residential structures. The majority of business facilities are located along the Route 522 corridor. According to the Department of Homeland Security Emergency Preparedness and Response Directorate NFIP Biennial Report for 2007 and 2008, the number of single family structures located in the county's flood hazard areas is 228. Other structures including commercial totaled 4. Also see Appendix N for Repetitive Loss information.

A listing of districts and municipalities located within Morgan County are identified below and has a high potential exposure risk to flooding.

Morgan County Districts and Major Water Sources:

Allen District – Warm Springs Run, Potomac River
Bath District - Warm Springs Run, Potomac River
Cacapon District – Cacapon River, Potomac River
Sleepy Creek District – Sleepy Creek and its tributaries, Potomac River, Cherry Run
Rock Gap District – Sleepy Creek and its tributaries
Timber Ridge District – Sleepy Creek and its tributaries

Town of Bath

Warm Springs Run

Town of Paw Paw
Potomac River

All remaining hazards have a low to medium risk potential exposure to Morgan County as a whole.

2. Loss Estimation

The final step in the risk assessment process will be the generation of loss estimations. This step assists in estimation the potential losses to assets from identified hazards. In order to conduct the loss estimation each asset will be assigned a value based on data collected from the Morgan County Tax Assessor. Parcel location information will be determined and cross referenced with the tax map to determine the tax id number for each structure within the hazard area. This information, along with the deed record and the property owner, will be used to obtain the assessed value. The assessed values are considered to be 60% of the market values as of June 2008. Loss estimation data was not reliable for this update.

MITIGATION STRATEGY

201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based upon existing authorities, policies, programs, and resources, and its ability to expand on and improve these existing tools.

The mitigation strategy is a description of mitigation goals and strategies to reduce or avoid long-term vulnerabilities to the identified hazards. It identifies a comprehensive range of specific mitigation actions and projects being considered for Morgan County to reduce the effects of each hazard. The cost benefits are considered when implementing priorities are completed.

13. LOCAL HAZARD MITIGATION GOALS

201.6(c)(3)(i): The hazard mitigation strategy shall include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Goal: Reduce the current and future risks from hazards in Morgan County

Objective: Direct new development away from high hazard areas.

Action: Review existing regulations to ensure adequacy in reducing the amount of future identified hazard areas.

Action: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.

Action: Review all capital improvement plans to ensure that infrastructure improvements are not directed towards hazardous areas.

Objective: Evaluate and update existing floodplain ordinances to meet or exceed the NFIP standards.

Action: Work with municipalities to update all floodplain ordinances adopted prior to 1987.

Objective: Improve the enforcement of existing floodplain regulations.

Action: Provide additional training to county and municipal development officials on NFIP requirements.

Objective: Ensure that flood insurance policies remain affordable through the county and municipal government programs.

Action: Support Morgan County's efforts in the CRS program.

Action: Provide training to municipalities on the CRS program and encourage them to participate.

Goal: Improve emergency preparedness in Morgan County and its incorporated municipalities.

Objective: Update emergency operations plan (EOP).

Action: Review the existing *Morgan County EOP* and update where necessary based on the recommendations of the *Morgan County Hazard Mitigation Plan*.

Action: Ensure that the county and all municipalities adopt the revised EOP.

Objective: Equipment assessment at the E-911 Communications Center.

Action: Develop a plan to implement the Needs Assessment recommendations developed by the Public Safety System Consultant

Goal: Reduce the potential impact of natural and man-made disasters on private property.

Objective: Encourage participation in the National Flood Insurance Program.

Action: Conduct outreach efforts to educate municipalities about the NFIP and its policyholders in Morgan County and its municipalities.

Action: Obtain updates information on the number of NFIP policyholders in Morgan County and its municipalities.

Objective: Develop public/private partnerships toward the protection of private properties.

Action: Continue to support initiatives established under the Morgan County Office of Emergency Services.

Action: Evaluate the feasibility of a funded Project Impact Coordinator Position for Morgan County.

Objective: Identify all repetitive loss structures throughout the county.

Action: Collect updated information on the number and location of all repetitive loss properties throughout the county and the municipalities. Information is not easily accessible at this time but will collect this data within the next five year update cycle

Action: Develop a database of information on all repetitive loss properties including maps. Information is not easily accessible at this time but will collect this data within the next five year update cycle

Action: Identify owners of repetitive loss properties that may be willing to participate in future property acquisition and relocation projects.

Goal: Reduce the potential impact of natural disasters on the county's historic treasures.

Objective: Update flood hazard mapping.

Action: Work with FEMA and WVOES on the Map Modernization Program to improve FIRMS.

Objective: Assess vulnerability of transportation systems and assets located in hazard areas.

Action: Work with WV Department of Highways to identify areas of frequent roadway flooding and develop mitigation strategies.

Action: Contact commercial and commuter rail lines to ensure that measures are being taken to address hazard risks.

Objective: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous material risks throughout the county.

Action: Apply for Hazardous Materials Emergency Preparedness (HMEP) grant from WVOES to finance the development of a hazardous materials survey for Morgan County.

Action: Identify strategies to mitigate risks from the transportation and/or storage of hazardous materials in Morgan County.

14. IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

The Core Team for Morgan County has identified several hazard mitigation projects that will benefit the county and its municipalities. These projects were identified through public forums and Core team meetings which included the Local Emergency Planning Committee and other interested parties who had attended the meetings. They are listed as follows.

Prevention and Education Actions:

- Work with the West Virginia Division of Highways (WVDOH) to identify areas of frequent roadway flooding and develop mitigation strategies.
- Work with the Federal Emergency Management Agency (FEMA) and the West Virginia Division of Homeland Security and Emergency Management (WVDHSEM) on implementing the Community Rating System (CRS) program.

Structural Actions:

- Ensure that all shelters have adequate emergency power resources.

15. IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS: NATIONAL FLOOD INSURANCE PROGRAM (NFIP) COMPLIANCE

201.6(c)(3)(ii): The mitigation strategy must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

Participation in the NFIP is based on a voluntary agreement between a community and FEMA. The three basic components of the NFIP include:

1. Floodplain identification and mapping the risk
2. Responsible floodplain management
3. Flood insurance.

The minimum compliance actions include the following:

Floodplain identification and mapping

- Maintenance of publicly accessible copy of effective FIRM (Flood insurance rate map) maps and FIS (flood insurance study)
- Adopt most current DFIRM or FIRM and FIS
- Support of local requests for map updates
- Share with FEMA any new technical or scientific data that could result in map revisions within 6 months of creation or identification of new data
- Assistance with local floodplain determinations
- Maintain a record of approved Letters of Map Change

Floodplain Management

Adopt a compliant floodplain management ordinance that at a minimum regulates the following:

- Issue permits for all proposed development in the SFHA
- Obtain, review and utilize any Base Flood Elevation and floodway data and require BFE data for subdivision proposals and other development proposals larger than 50 lots or 5 acres
- Identify measures to keep all new and substantially improved construction reasonably sake from flooding to or above the Base Flood Elevation, including anchoring, using flood resistant materials, designing or locating utilities and service facilities to prevent water damage.
- Document and maintain records of elevation data that document lowest elevation for new or substantially improved structures.

Enforce the ordinance by monitoring Compliance and taking remedial action to correct violations.

Consider adoption of activities that extends beyond the minimum requirements, including those identified for participation in the Community Rating System, freeboard, prohibition of production or storage of chemicals in SFHA, prohibition of certain types of structures such as manufactures homes, jails, prohibition of certain types of residential housing such as manufactures homes and finally, adopt floodplain ordinances that prohibit any new residential or non-residential structures in the SFHA.

Flood Insurance

Educate community members about the availability and value of flood insurance.

Inform community property owner about changes to the DFIRM/FIRM that would impact their insurance rates.

Provide general assistance to community members relating to insurance issues.

Morgan County has been a participant in the NFIP program since 1986 with the initial adoption of our floodplain ordinance. Since this time, there have been several updates to the regulations refining the requirements and restrictions. Within this past year, the Morgan County Planning Commission has also incorporated floodplain regulations within their subdivision ordinance which restricts building footprints with the 100 year floodplain.

16. IMPLEMENTATION OF MITIGATION ACTIONS

201.6(c)(3)(iii): The mitigation strategy section shall include an action plan describing how the actions identified in section c(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

The criteria used to create the list of objectives were based primarily on the hazard history of Morgan County. The Core Team analyzed the historical data of hazard events and determined that flooding prevention and education was a priority. Deficiencies during previous flood events were documented and the objectives were created from those recommendations.

These objectives are actions desirable for all of Morgan County to include the Town of Bath and the Town of Paw Paw.

Based on the recommendations of the Core Planning Team the following implementation schedule has been developed. Strategies have been listed by priority according to the ranking assigned by the Core Planning Team. The planning Team found it difficult to obtain public involvement in its discussions regarding the implementation schedule. Through many roundtable discussions of the Planning Team itself, the following schedule was created.

Objective: Direct new development away from hazard areas.
County Wide, Town of Bath, Town of Paw Paw

Action: Review all existing regulations to ensure adequacy in reducing the amount of future identified hazard areas.
Priority: High
Agencies: Planning Commission, Floodplain Coordinator, County Commission, Town Councils, OES and FEMA

Time Frame and Status Notes:
2006 – Subdivision Ordinance was updated restricting placement of home sites within 100-year flood plain
2007 – Updated Morgan County EOP

2008/2009 – Completed update of Floodplain regulations within county and towns to comply with requirements of FEMA and NFIP
Funding Source: County funding/grant funding when available

Action: Review all comprehensive plans to ensure that designated growth areas are not in hazard areas.
Priority: High
Implementing Agencies: Planning Commission, Floodplain Coordinator, County Commission, Town Councils, WVOES
Time Frame and Status Notes:
2007 - *C*ompleted update Comprehensive Plan
Funding Source: Local funds, F&W Federation

Action: Review all capital improvement plans to ensure that infrastructure improvements are not directed towards hazardous areas.
Priority: High
Agencies: County Commission, Town Councils, Planning Commission and staff, OES
Time Frame and Status Notes: Not completed to date
Anticipate completion within one year
Funding Source: County Funding when available

Objective: Evaluate and update existing floodplain ordinances to meet or exceed the NFIP standards. County-wide, Town of Bath, Town of Paw Paw

Action: Review existing floodplain ordinance to ensure adequacy in reducing the potential danger to public health and safety.
Priority: High
Agencies: Planning Commission, Floodplain Coordinator, OES, FEMA, County Commission, Town Councils
Time Frame and Status Notes: Project completed in spring 2009
Implemented freeboard, stricter floodway requirements.
Funding Source: WVDHS funding, Local funds when available.

Action: Work with municipalities to update floodplain ordinances
Priority: High
Agencies: Planning Commission, Floodplain Coordinator, Town Councils, OES, FEMA, County Commission, Town Councils
Time Frame and Status Notes: Project completed in spring 2009
Working with town to update floodplain ordinances.
Funding Source: Local funds

Objective: Improve the enforcement of existing floodplain regulations.
County-wide, Town of Bath, Town of Paw Paw

Action: Provide additional training to county and municipal officials and staff on NFIP requirements.
Priority: High
Agencies: Town Councils, Floodplain Coordinator, Planning Commission and staff, OES, FEMA, County Commission
Time Frame and Status Notes: On going – attend training classes when available. Work with town councils on compliance with floodplain ordinance.
May 2009-Floodplain Manager attended Floodplain Management course at EMI for four days. (2nd training seminar attended)
Funding Source: Local funding, FEMA

Objective: Ensure that flood insurance policies remain affordable through the county and municipal government programs.
County-wide, Town of Bath, Town of Paw Paw

Action: Provide training to municipalities on the CRS program and encourage them to participate.
Priority: High
Agencies: Town Councils, Floodplain Coordinator, Planning Commission and staff, OES, FEMA, County Commission
Time Frame and Status Notes: on going
Floodplain Manager discussed CRS requirements during recent CAV. Will be pursuing this year.
Funding Source: County funding when available

Objective: Update Emergency Operations Plans (EOP)
County–wide, Town of Bath, Town of Paw Paw

Action: Review the existing Morgan County EOP and update where necessary based on the recommendations of the Morgan County Hazard Mitigation Plan.
Priority: High
Agencies: OES, County Commission, Town Councils, Communications Committee
Time Frame and Status Notes: project completed 2007
Required to do periodic annexes annually.
Funding Source: FEMA, EMA, Local funding

Action: Ensure that the county and all municipalities adopt the revised EOP
Priority: High
Agencies: Town Councils, OES
Time Frame and Status Notes: Update completed in 2007. On-going review of plan.
Funding Source: Local funds

Objective: Improve coordination and communication among disaster response organizations, local and county governments.
County-wide, Town of Bath, Town of Paw Paw

Action: Establish a protocol for the sharing of annual shelter survey information between the local Red Cross chapter and the Morgan County Office of Emergency Services.
Priority: High
Agencies: Red Cross, OES, Sheriff's Office, State Police, LEPC
Time Frame and Status Notes: On going
2008/2009 - Government officials and staff all NIMS compliant. Government involved with OES mock disaster training and quarterly LEPC meetings.
Funding Source: Local funding, FEMA, EMA

Action: Expand the mission and membership of the Morgan County Local Emergency Planning Committee to act as a countywide disaster task force.
Priority: High
Agencies: LEPC, OES, Sheriff's Office, State Police
Time Frame and Status Notes: On going
Current LEPC group meets quarterly.
Funding Source: No funds necessary

Action: Develop adequate emergency shelter and evacuation plans for citizens and animals (domestic pets, livestock and wildlife).
Priority: High
Agencies: County Commission, Town Councils, OES, LEPC, Red Cross, DNR, Humane Society, Sheriff's Office
Time Frame and Status Notes: On going
OES working with school board to refine evacuation plans and shelter arrangements.
Funding Source: Local funding, USDA Programs

Objective: Equipment assessment at the 911 Communications Center.
County-wide

Action: Develop a plan to implement the Needs Assessment recommendations developed by the Public Safety System Consultant.
Priority: Medium
Agencies: OES, County Commission
Time Frame and Status Notes: On going
Funding Source: Local Funding when available, FEMA, EMA

Objective: Encourage participation in the National Flood Insurance program.
County-wide, Town of Bath, Town of Paw Paw

Action: Conduct outreach efforts to educate municipalities about the NFIP and its policyholders in Morgan County and its Municipalities.
Priority: High
Agencies: Floodplain Coordinator, County Commission, Town Councils, OES, FEMA
Time Frame and Status Notes: Floodplain Manager participates in local fair each year to provide documentation to public regarding floodplain regulations and safety precautions from flooding. Also does mailing to property owner within flood prone areas to provide information regarding floodplain regulations. On-going effort.
Funding Source: Local funding when available, FEMA, EMA

Action: Obtain updated information on the number of NFIP policyholders in Morgan County and its municipalities
Priority: Medium
Agencies: OES, FEMA, Floodplain Coordinator
Time Frame and Status Notes: On-going
Received updated information during CAV in 2009
Funding Source: No funds necessary

Objective: Develop public/private partnerships toward the protection of private properties. County-wide, Town of Bath, Town of Paw Paw

Action: Continue to support initiatives established under the Morgan County Office of Emergency Services.
Priority: Medium
Agencies: OES, Planning Commission and staff, County Commission, Town Councils
Time Frame and Status Notes: On going
Funding Source: No funds necessary

Action: Evaluate the feasibility of a funded Project Impact Coordinator position for Morgan County.
Priority: Low
Agencies: OES, County Commission
Time Frame and Status Notes: Two years
Funding Source: Local funding if available

Objective: Identify all repetitive loss structures throughout the county.
County-wide, Town of Bath, Town of Paw Paw

Action: Collect updated information on the number and location of all repetitive loss properties throughout the county and the municipalities.
Priority: Medium
Agencies: Floodplain Coordinator, OES, FEMA

Time Frame: On-going
Information provided at CAV in 2009.
Funding Source: Local funding when available/county personnel when available

Action: Identify owners of repetitive loss properties that may be willing to participate in future property acquisition and relocation projects.
Priority: Medium
Agencies: Floodplain Coordinator, OES, FEMA
Time Frame and Status Notes: Annually
Floodplain Manager will follow up on data provided during CAV.
Funding Source: No funds necessary/Annual application submitted

Action: Develop a database of information on all repetitive loss properties including maps.
Priority: Medium
Agencies: Floodplain Coordinator, OES
Time Frame and Status Notes: 5 years
Floodplain Manager will follow up on data provided during CAV.
Funding Source: Local funds when available, FEMA, EMA

Objective: Improve coordination of mitigation efforts between the National Park Service and the Town of Paw Paw.

Action: Establish a formal process for the city and the Park Service to coordinate disaster related efforts, which will include defining boundaries and establishing responsibilities.
Priority: Medium
Agencies: Town of Paw Paw, National Park Service
Time Frame and Status Notes: On going
Town of Paw Paw continuing this effort.
Funding Source: FEMA Flood Emergency Program, Local funds, Town of Paw Paw

Action: Conduct training exercises that include representatives from the city and the Park Service to facilitate increased coordination.
Priority: Medium
Agencies: Town of Paw Paw, National Park Service, OES
Time Frame and Status Notes: two years
Funding Source: Local funds, Town of Paw Paw, NPS Programs

Objective: Identify and protect other historic structures throughout the county that are at risk of hazards. County-wide, Town of Bath, Town of Paw Paw

Action: Develop mitigation strategies to protect any at-risk historic properties.

Priority: Medium
Agencies: County Historic Society, OES, FEMA, Floodplain Coordinator
Time Frame and Status Notes: two years, Town of Paw Paw continuing this effort.
2009 - Towns updating Floodplain Ordinances will assist in this effort.
Funding Source: Local funds

Action: Conduct a survey of all historic sites that are located in hazard areas.
Priority: Medium
Agencies: County Historic Society, OES, FEMA, Floodplain Coordinator
Time Frame: one year
2007 – research documented in Comprehensive Plan
Funding Source: No funds necessary

Objective: Update flood hazard mapping
County-wide, Town of Bath, Town of Paw Paw

Action: Work with FEMA and WVOES on the Map Modernization Program to improve FIRMS.
Priority: High
Agencies: Floodplain Coordinator, County Commission, Town Councils, OES, FEMA
Time Frame and Status Notes: ordinance updated spring 2009
Expect DFIRM mapping this year.
Funding Source: Flood Prevention Program, FEMA, EMA, Local funds

Objective: Assess vulnerability of transportation systems and assets located in hazard areas. County-wide, Town of Bath, Town of Paw Paw

Action: Work with WV Department of Highways to identify areas of frequent roadway flooding and develop mitigation strategies.
Priority: High
Agencies: DOT, OES, Floodplain Coordinator, County Commission, Town Councils
Time Frame and Status Notes: One year
Floodplain Manager to meet with DOH reps to review new mapping and hazard areas during high water events. On-going task.
Funding Source: Local funds when available

Action: Contact commercial and commuter rail lines to ensure that measures are being taken to address hazard risks.
Priority: Medium
Agencies: DOT, CSX, OES, Floodplain Coordinator, County Commission, Town Councils
Time Frame and Status Notes: One year

OES performs mock drills relating to rail disasters
Funding Source: Local funds when available

Objective: Conduct a Hazardous Materials Survey to better understand the nature and extent of hazardous material risks throughout the county.
County-wide, Town of Bath, Town of Paw Paw

Action: Identify strategies to mitigate risks from the transportation and/or storage of hazardous materials in Morgan County.
Priority: Medium
Agencies: OES, LEPC
Time Frame and Status Notes: Two years
OES/LEPC continually monitors Tier II reports
Funding Source: HMEP, Local funds when available

Action: Apply for hazardous Materials Emergency Preparedness (HMEP) grant from WVOES to finance the development of a hazardous materials survey for Morgan County
Priority: Medium
Agencies: OES, LEPC
Time Frame and Status Notes: Two years
Funding Source: HMEP, Local funds when available

17. MULTI-JURISDICTIONAL MITIGATION ACTIONS

201.6(c)(3)(iv): For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

All floodplains in Morgan County are subject to floodplain regulations as delineated in the Flood Insurance maps developed by FEMA and the County's ordinances, which are updated to comply with State and Federal regulations. The Flood Insurance Program was established by the National Flood Insurance Act of 1968 and provides previously unavailable flood insurance to property owners within delineated areas. The Act prohibits Federal financial assistance for construction projects within non-participating communities. Although Morgan County does participate in the program, concern has been expressed as to the accuracy of published Flood Insurance Program maps. The Federal Program is expected to update the maps at which time the County will provide details of existing flood control dams that may not have been considered in previous mapping of the Berkeley Springs area.

PLAN MAINTENANCE PROCESS

18. MONITORING, EVALUATING, AND UPDATING THE PLAN

201.6(c)(4)(i): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

According to the *Disaster Mitigation Act of 2000*, local plans are required to develop a method and schedule of monitoring, evaluating and updating the hazard mitigation plan within a five-year cycle.

On an annual basis, the County Commission and the Core Planning Team members will meet to develop and end of year report. This report should evaluate the goals and objectives to ensure they address current and expected conditions, determine if the nature or magnitude of risk has changed, evaluate whether the current resources are adequate for implementing the plan. Document any implementation problems such as technical, political, legal, or coordination issues with other agencies and discuss whether the outcomes have occurred as expected. Copies of the annual report should be made available to each of the implementation agencies, local governments, citizens, WVOES and FEMA Region III.

The plan will be reviewed at a minimum of every five years (or following major disaster events) to gauge its effectiveness in predicting hazard susceptibility areas, update asset inventory and update the timelines assigned to mitigation projects.

The Morgan County Office of Emergency Services is the primary agency responsible for the implementation this plan. The most cases, the county OES is the liaison between local government and state/federal emergency management and disaster assistance agencies. The county OES along with the county planning office staff and members of the LEPC will update the mitigation plan components as necessary. The monitoring of this plan also includes methods for ensuring that projects are successfully implemented and contribute to the achievement of the mitigation goals.

19. INCORPORATION INTO EXISTING PLANNING MECHANISMS

201.6(c)(4)(ii): The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.

The plan is required to be updated every five years after the adoption date. In the event of a significant disaster or any substantial changes in land use planning or regulations that would impact the recommended mitigation projects, more frequent updates should be considered. The Core Planning Team in partnership with the local planning department, emergency management, town councils and the county commission would be responsible

for overseeing the update of the hazard mitigation plan. The update process would be similar to the one used to develop the original plan. Opportunities for public involvement would be a part of this process through public forums, local press and desire to establish additional core team members.

The capability assessment describes the legal authority vested in local governments to pursue measures to mitigate the impacts of natural hazards. This capability assessment focused in the evaluation of Morgan County's existing programs to determine what vehicles are already in place to support mitigation activities. The Hazard Mitigation Plan is an integral part of the continued review of the county's existing ordinances and plans. County staff and emergency personnel continue to review the plan's strategies and objectives to accomplish the established goals. A brief overview of existing plans and ordinances for the county and municipalities are referenced below.

The members of the core planning team are involved in the community as a whole. They consist of emergency management, planning and development, emergency response and local government. As members of the mitigation planning team, these individuals will carry mitigation concepts into other planning areas.

The Morgan County Office of Emergency Services incorporates mitigation principles into its emergency operations planning in an effort to predetermine the hazards to which responders may respond.

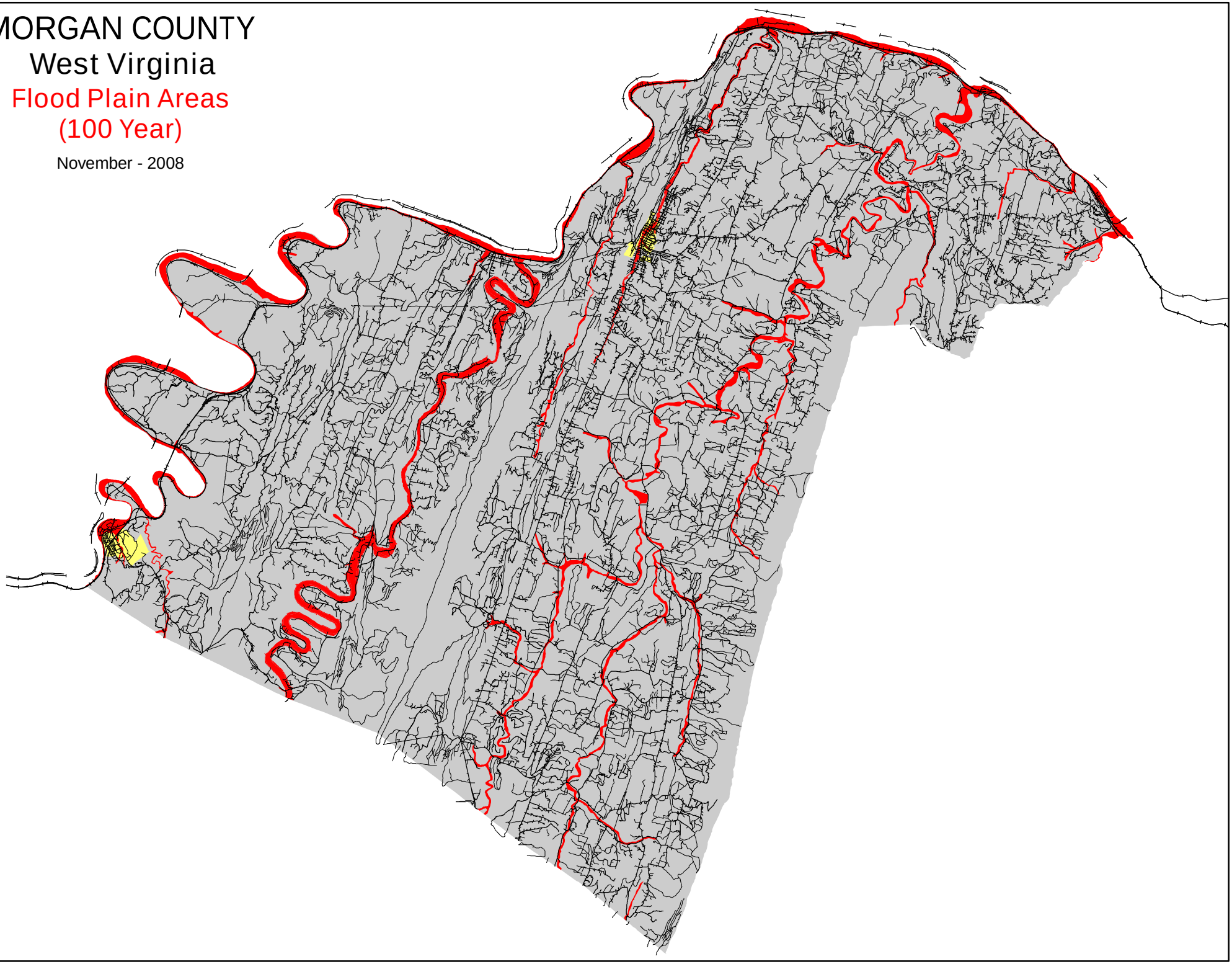
The Morgan County Commission, Town of Bath and Town of Paw Paw maintain a copy of this plan. Citizens will be able to review and comment on the plan which will be made available by viewing on the county's website or obtaining at a hard copy. The updating process will begin with the core planning team and also involves several public forums to solicit public comments.

Flood Insurance Rate Maps (FIRM)
For
Morgan County, West Virginia and Incorporated Areas

Map Number	**Effective Date**
54065C0013 C (Town of Paw Paw)	March 5, 1996
54065C0025 C	May 18, 2000
54065C0075 C	May 18, 2000
54065C0028 C (Town of Bath)	March 5, 1996
54065C0036 C	March 5, 1996
54065C0050 C	March 5, 1996
54065C0100 C	March 5, 1996

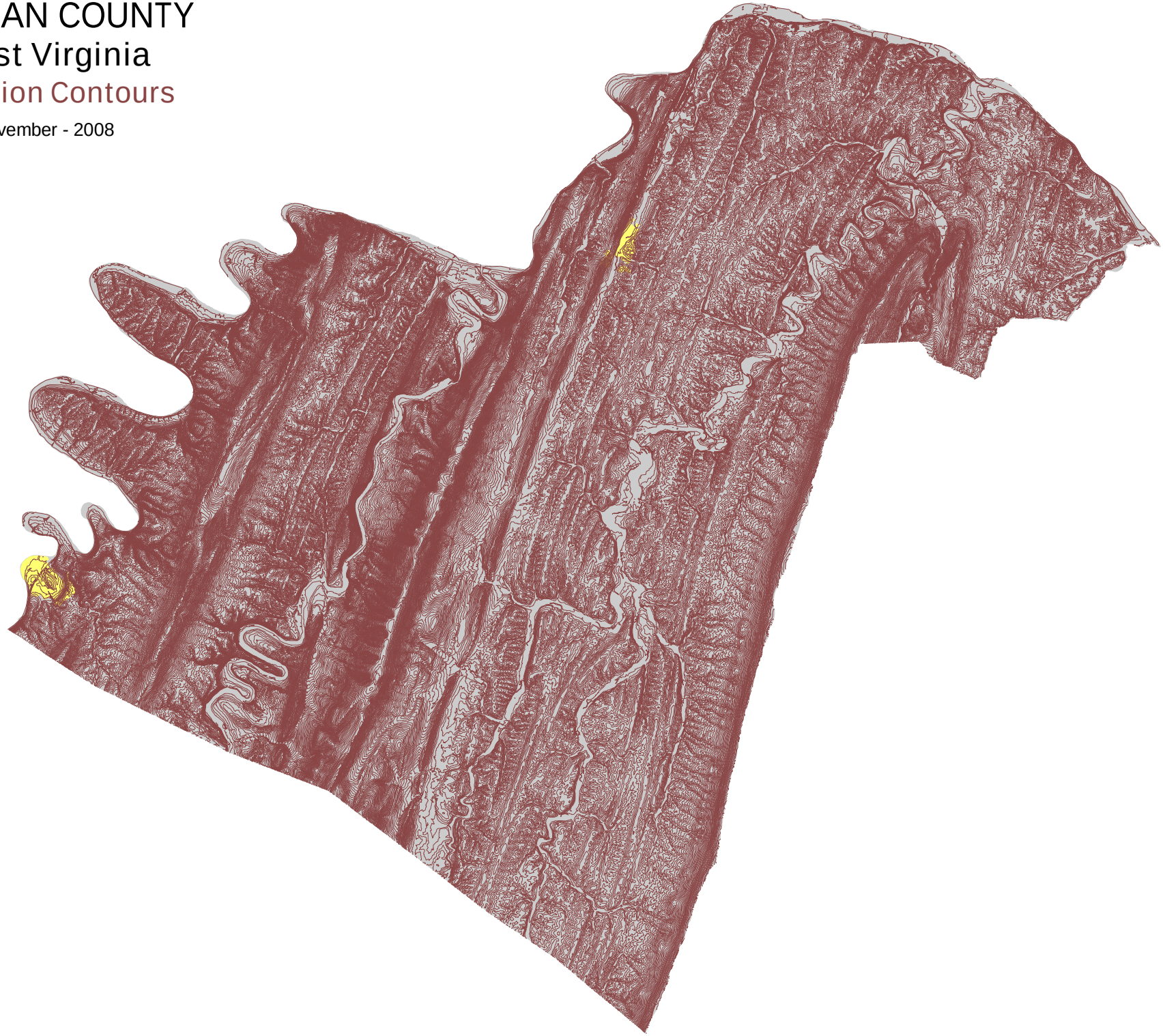
MORGAN COUNTY
West Virginia
Flood Plain Areas
(100 Year)

November - 2008



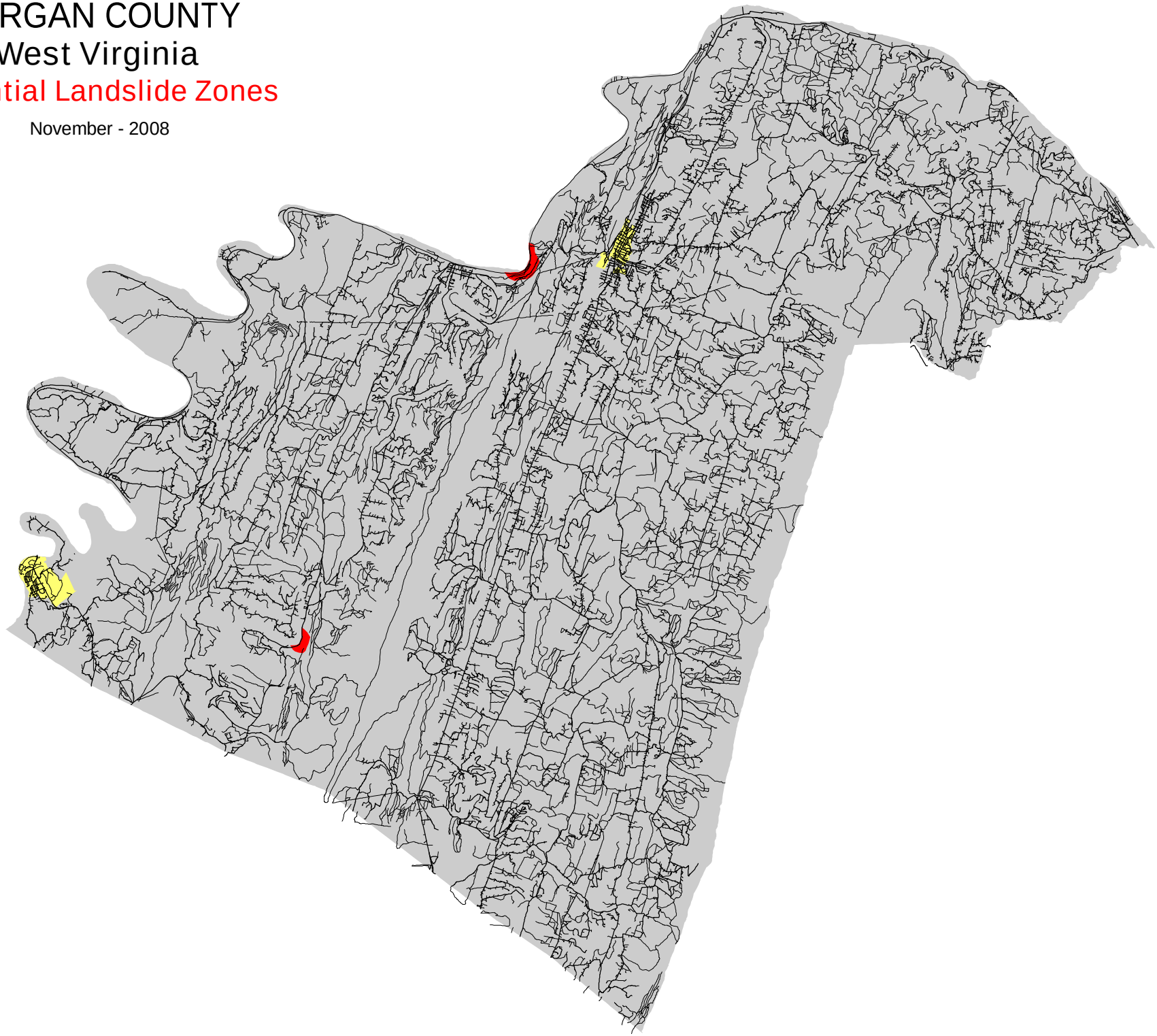
MORGAN COUNTY
West Virginia
Elevation Contours

November - 2008



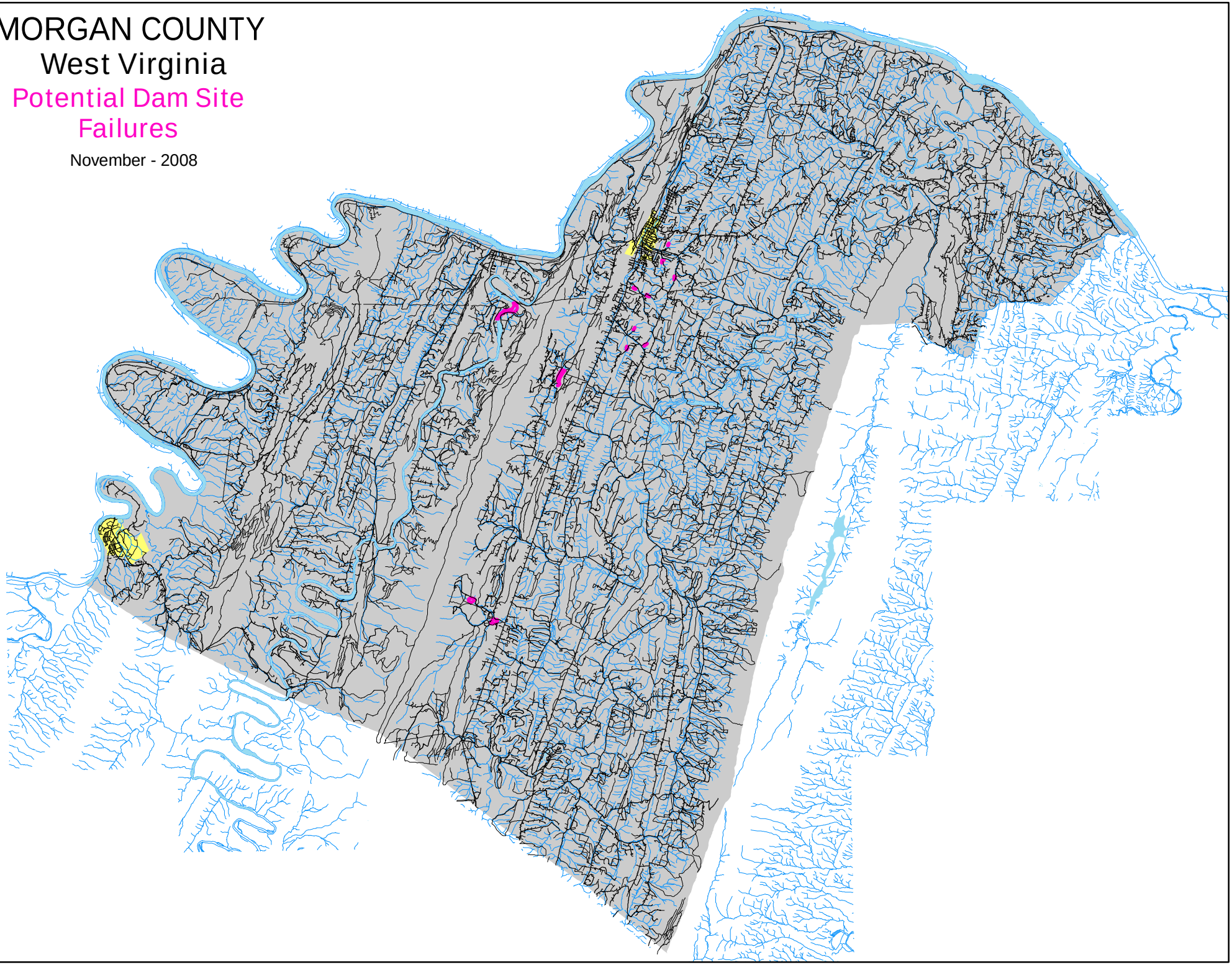
MORGAN COUNTY
West Virginia
Potential Landslide Zones

November - 2008



MORGAN COUNTY
West Virginia
Potential Dam Site Failures

November - 2008



MORGAN COUNTY, WV CRITICAL INFRASTRUCTURE

LE	Berkeley Springs Police Department Station	271 Wilkes Street	Berkeley Springs	N	39	-	37	-	47.9
Schools	Berkeley Springs Senior High School	149 Concord Avenue	Berkeley Springs	N	39	-	37	-	04.8
Water	Berkeley Springs State Park - Public Water Supply Springs	1 Wilkes Street	Berkeley Springs	N	39	-	37	-	35.0
Fire	Berkeley Springs VFD Station	34 North Mercer Street	Berkeley Springs	N	39	-	37	-	36.8
Water	Berkeley Springs Waterworks Storage Tank - Horse Ridge	462 Fairview Drive	Berkeley Springs	N	39	-	37	-	45.0
Water	Berkeley Springs Waterworks Storage Tank - Meyers Road	392 Myers Road	Berkeley Springs	N	39	-	36	-	36.6
Water	Berkeley Springs Waterworks Storage Tank - Warm Springs Ridge	284 Wellness Trail	Berkeley Springs	N	39	-	34	-	41.6
Water	Berkeley Springs Waterworks Storage Tank - Warm Springs Ridge	580 Cacapon Road	Berkeley Springs	N	39	-	37	-	35.5
Water	Berkeley Springs Waterworks Storage Tank - WMH	186 War Memorial Drive	Berkeley Springs	N	39	-	37	-	32.0
Water	Berkeley Springs Waterworks Treatment Plant	99 Wilkes Street	Berkeley Springs	N	39		37	-	39.9
Bridge	Bridge - CSX Railroad Over Cacapon River	8960 CSX Road	Great Cacapon	N	39	-	37	-	11.5
Bridge	Bridge - Winchester Street Over CSX Railroad Tracks	305 Winchester Street	Paw Paw	N	39	-	31	-	50.1
RR	CSX Transportation Mainline Railroad Tracks	Paw Paw - GC - Cherry Run	Berkeley Springs	N	39	-		-	
Telephone	Frontier Telephone CO - Paw Paw	241 Winchester Street	Paw Paw	N	39	-	31	-	53.8
Fire	Great Cacapon VFD Station	179 Spring Street	Great Cacapon	N	39	-	37	-	08.6
Schools	Greenwood Elementary School	8989 Winchester Grade Road	Berkeley Springs	N	39	-	28	-	57.8
Communications	Morgan County 911 PSAP	38 Dispatch Lane	Berkeley Springs	N	39	-	37	-	30.1
Communications	Morgan County 911 Radio Tower - Overlook Trail	4169 Overlook Trail	Berkeley Springs	N	39	-	27	-	43.0
Judicial	Morgan County Courthouse	77 Fairfax Street	Berkeley Springs	N	39	-	37	-	37.2
COOP	Morgan County EOC	1258 Valley Road	Berkeley Springs	N	39	-	36	-	37.5
Health	Morgan County Health Department Offices	187 South Green Street	Berkeley Springs	N	39	-	36	-	37.4
Judicial	Morgan County Magistrates Offices	111 Fairfax Street	Berkeley Springs	N	39	-	37	-	36.2
EMS	Morgan County Rescue Service Station	1258 Valley Road	Berkeley Springs	N	39	-	36	-	37.1
Schools	Morgan County Schools - BOE Offices	249 Harrison Avenue	Berkeley Springs	N	39	-	37	-	51.6
Schools	Morgan County Schools - Bus Garage/Depot	2 Myers Road	Berkeley Springs	N	39	-	36	-	53.5
LE	Morgan County Sheriff's Office Station	1260 Valley Road	Berkeley Springs	N	39	-	36	-	36.7
Schools	Paw Paw Elementary School	60 Pirate Circle	Paw Paw	N	39	-	31	-	38.9
LE	Paw Paw Police Department Station	242 Winchester Street	Paw Paw	N	39	-	31	-	53.0
Sewer	Paw Paw PSD Wastewater Treatment Plant	208 Depot Street	Paw Paw	N	39	-	32	-	11.8
Schools	Paw Paw Senior High School	36 Pirate Circle	Paw Paw	N	39	-	31	-	39.6
Fire	Paw Paw VFD Station	44 Moser Avenue	Paw Paw	N	39	-	31	-	43.6
Water	Paw Paw Waterworks Pump Station - Potomac River	SW of downtown in river	Paw Paw	N	39	-	31	-	30.2
Water	Paw Paw Waterworks Storage Tank - Bevans Hill	114 Bevans Industrial Lane	Paw Paw	N	39	-	31	-	48.2
Water	Paw Paw Waterworks Treatment Plant	444 Bethel Road	Paw Paw	N	39	-	31	-	29.8
Schools	Pleasant View Elementary School	10500 Martinsburg Road	Hedgesville	N	39	-	36	-	32.6
Fire	South Morgan County VFD Station	10166 Winchester Grade Road	Berkeley Springs	N	39	-	27	-	58.8
Government	Town of Bath Municipal Office	271 Wilkes Street	Berkeley Springs	N	39	-	37	-	47.7
Government	Town of Paw Paw Municipal Office	122 Winchester Street	Paw Paw	N	39	-	31	-	58.6
Bridge	US 522 Bridge - Potomac River	5188 Hancock Road	Berkeley Springs	N	39	-	41	-	33.9
USPS	US Post Office - Berkeley Springs 25411	417 North Washington Street	Berkeley Springs	N	39	-	37	-	57.2
USPS	US Post Office - Great Cacapon 25422	5010 Central Avenue	Great Cacapon	N	39	-	37	-	07.8
USPS	US Post Office - Paw Paw 25434	93 Winchester Street	Paw Paw	N	39	-	32	-	00.5
Telephone	Verizon Telephone CO - Berkeley Springs	5 Thomas Lane	Berkeley Springs	N	39	-	37	-	22.2
Health	War Memorial Hospital	109 War Memorial Drive	Berkeley Springs	N	39	-	37	-	30.5
Schools	Warm Springs Intermediate School	575 Warm Springs Way	Berkeley Springs	N	39	-	37	-	58.9
Schools	Warm Springs Middle School	271 Warm Springs Way	Berkeley Springs	N	39	-	37	-	43.5
Sewer	Warm Springs PSD Wastewater Treatment Plant	1226 Hancock Road	Berkeley Springs	N	39	-	38	-	33.7
Sewer	Warm Springs PSD Wastewater Treatment Plant	41 Stinebaugh Lane	Great Cacapon	N	39	-	37	-	11.8
Schools	Widmeyer Primary School	10 Myers Road	Berkeley Springs	N	39	-	36	-	49.2
Transportation	WV DOH Headquarters - Berkeley Springs	166 DOH Lane	Berkeley Springs	N	39	-	36	-	12.3
Bridge	WV SR 9 Bridge - Cacapon River @ Fisher's Bridge	12710 Cacapon Road	Great Cacapon	N	39	-	31	-	43.8
Bridge	WV SR 9 Bridge - Cacapon River @ Great Cacapon	4909 Cacapon Road	Great Cacapon	N	39	-	37	-	05.8
Bridge	WV SR 9 Bridge - Cacapon River @ Largent	17812 Cacapon Road	Great Cacapon	N	39	-	28	-	51.5
Bridge	WV SR 9 Bridge - Potomac River	1 Edwin Miller Boulevard	Paw Paw	N	39	-	32	-	17.9
Bridge	WV SR 9 Bridge - Sleepy Creek at Spruce Pine Hollow	7469 Martinsburg Road	Berkeley Springs	N	39	-	38	-	20.7
Bridge	WV SR 9 Bridge Over CSX Railroad Tracks	422 Henry W. Miller Boulevard	Paw Paw	N	39	-	31	-	56.3
LE	WV State Police - Berkeley Springs Barrack	1750 Valley Road	Berkeley Springs	N	39	-	36	-	13.2

MORGAN COUNTY, WV CRITICAL INFRASTRUCTURE

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Bridge	WV SR 9 Bridge - Cacapon River @ Great Cacapon	4909 Cacapon Road	Great Cacapon	N	39	-	37	-	05.8
Bridge	WV SR 9 Bridge - Cacapon River @ Largent	17812 Cacapon Road	Great Cacapon	N	39	-	28	-	51.5
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Judicial	Morgan County Magistrates Offices	111 Fairfax Street	Berkeley Springs	N	39	-	37	-	36.2
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LE	WV State Police - Berkeley Springs Barrack	1750 Valley Road	Berkeley Springs	N	39	-	36	-	13.2
RR	CSX Transportation Mainline Railroad Tracks	Paw Paw - GC - Cherry Run	Berkeley Springs	N	39	-		-	
Schools	Berkeley Springs Senior High School	149 Concord Avenue	Berkeley Springs	N	39	-	37	-	04.8
Schools	Greenwood Elementary School	8989 Winchester Grade Road	Berkeley Springs	N	39	-	28	-	57.8
Schools	Morgan County Schools - BOE Offices	249 Harrison Avenue	Berkeley Springs	N	39	-	37	-	51.6
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Sewer	Warm Springs PSD Wastewater Treatment Plant	1226 Hancock Road	Berkeley Springs	N	39	-	38	-	33.7
Sewer	Warm Springs PSD Wastewater Treatment Plant	41 Stinebaugh Lane	Great Cacapon	N	39	-	37	-	11.8
Telephone	Frontier Telephone CO - Paw Paw	241 Winchester Street	Paw Paw	N	39	-	31	-	53.8
Telephone	Verizon Telephone CO - Berkeley Springs	5 Thomas Lane	Berkeley Springs	N	39	-	37	-	22.2
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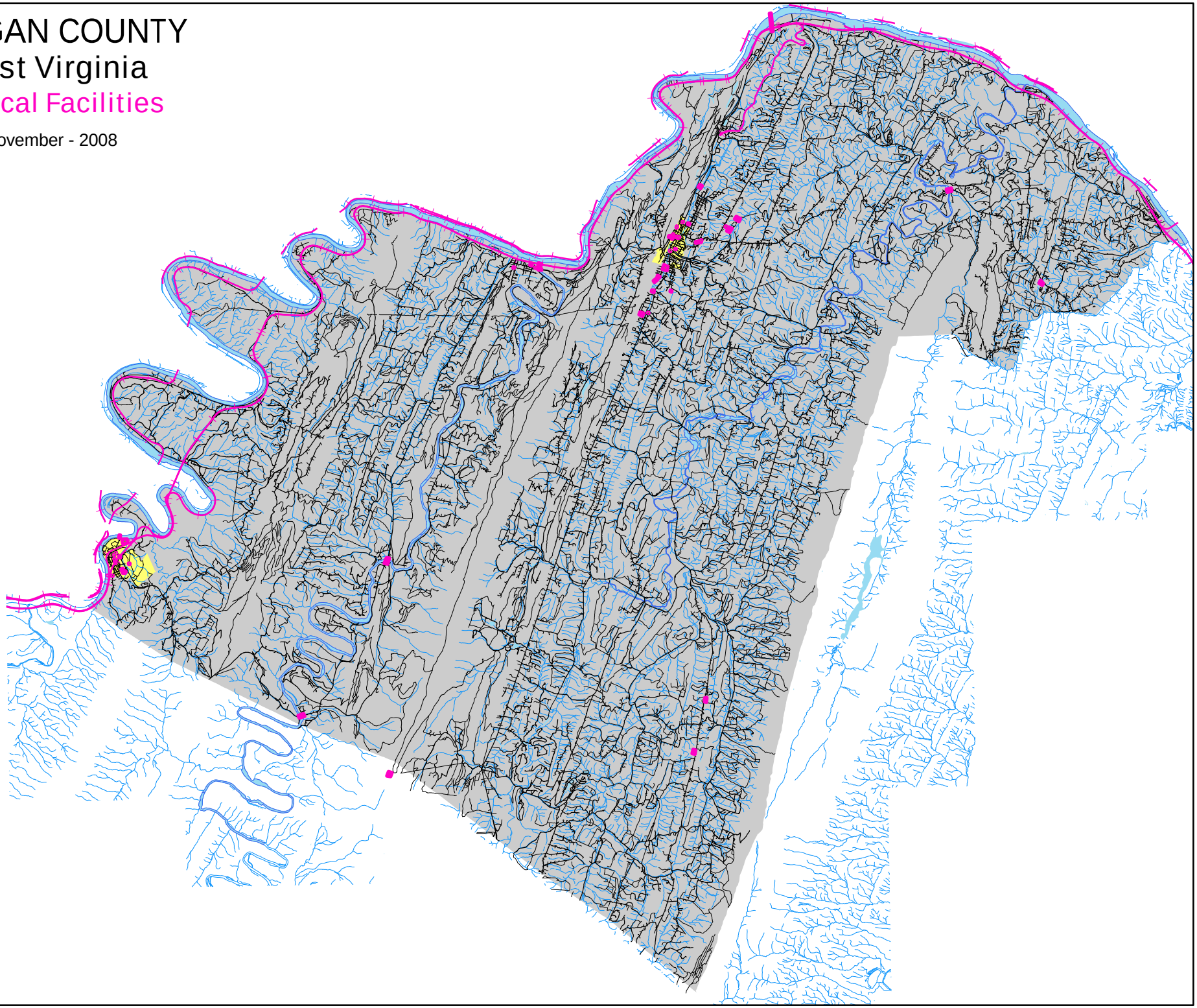
Water	Berkeley Springs State Park - Public Water Supply Springs	1 Wilkes Street	Berkeley Springs	N	39	-	37	-	35.0
Water	Berkeley Springs Waterworks Storage Tank - Horse Ridge	462 Fairview Drive	Berkeley Springs	N	39	-	37	-	45.0
Water	Berkeley Springs Waterworks Storage Tank - Meyers Road	392 Myers Road	Berkeley Springs	N	39	-	36	-	36.6
Water	Berkeley Springs Waterworks Storage Tank - Warm Springs Ridge	284 Wellness Trail	Berkeley Springs	N	39	-	34	-	41.6
Water	Berkeley Springs Waterworks Storage Tank - Warm Springs Ridge	580 Cacapon Road	Berkeley Springs	N	39	-	37	-	35.5
Water	Berkeley Springs Waterworks Storage Tank - WMH	186 War Memorial Drive	Berkeley Springs	N	39	-	37	-	32.0
Water	Berkeley Springs Waterworks Treatment Plant	99 Wilkes Street	Berkeley Springs	N	39		37	-	39.9
Water	Paw Paw Waterworks Pump Station - Potomac River	SW of downtown in river	Paw Paw	N	39	-	31	-	30.2
Water	Paw Paw Waterworks Storage Tank - Bevans Hill	114 Bevans Industrial Lane	Paw Paw	N	39	-	31	-	48.2
Water	Paw Paw Waterworks Treatment Plant	444 Bethel Road	Paw Paw	N	39	-	31	-	29.8
				N	39	-		-	
				N	39	-		-	

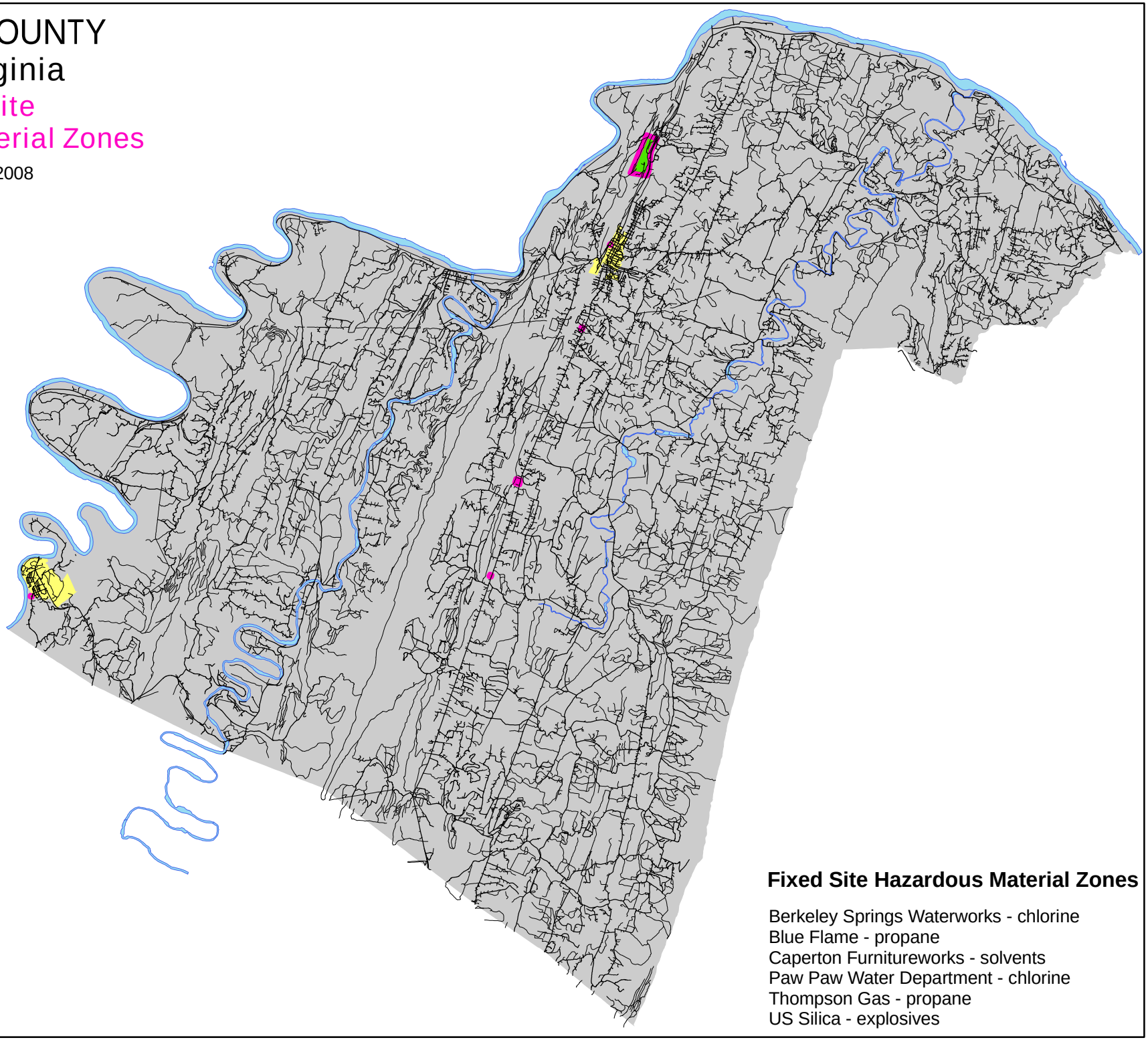
MORGAN COUNTY
West Virginia
Critical Facilities

November - 2008



MORGAN COUNTY
West Virginia
Fixed Site
Hazardous Material Zones

November - 2008

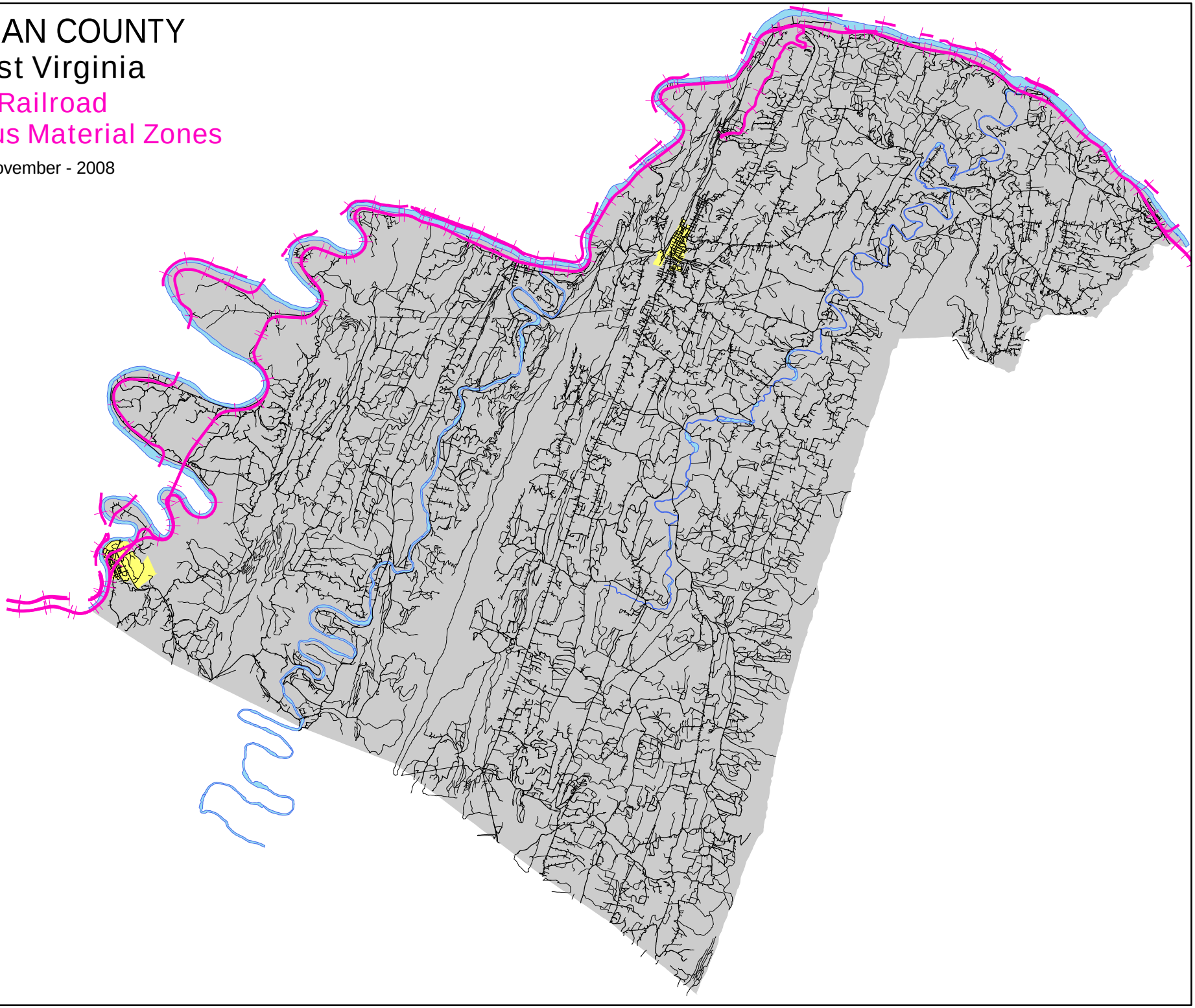


Fixed Site Hazardous Material Zones

Berkeley Springs Waterworks - chlorine
Blue Flame - propane
Caperton Furnitureworks - solvents
Paw Paw Water Department - chlorine
Thompson Gas - propane
US Silica - explosives

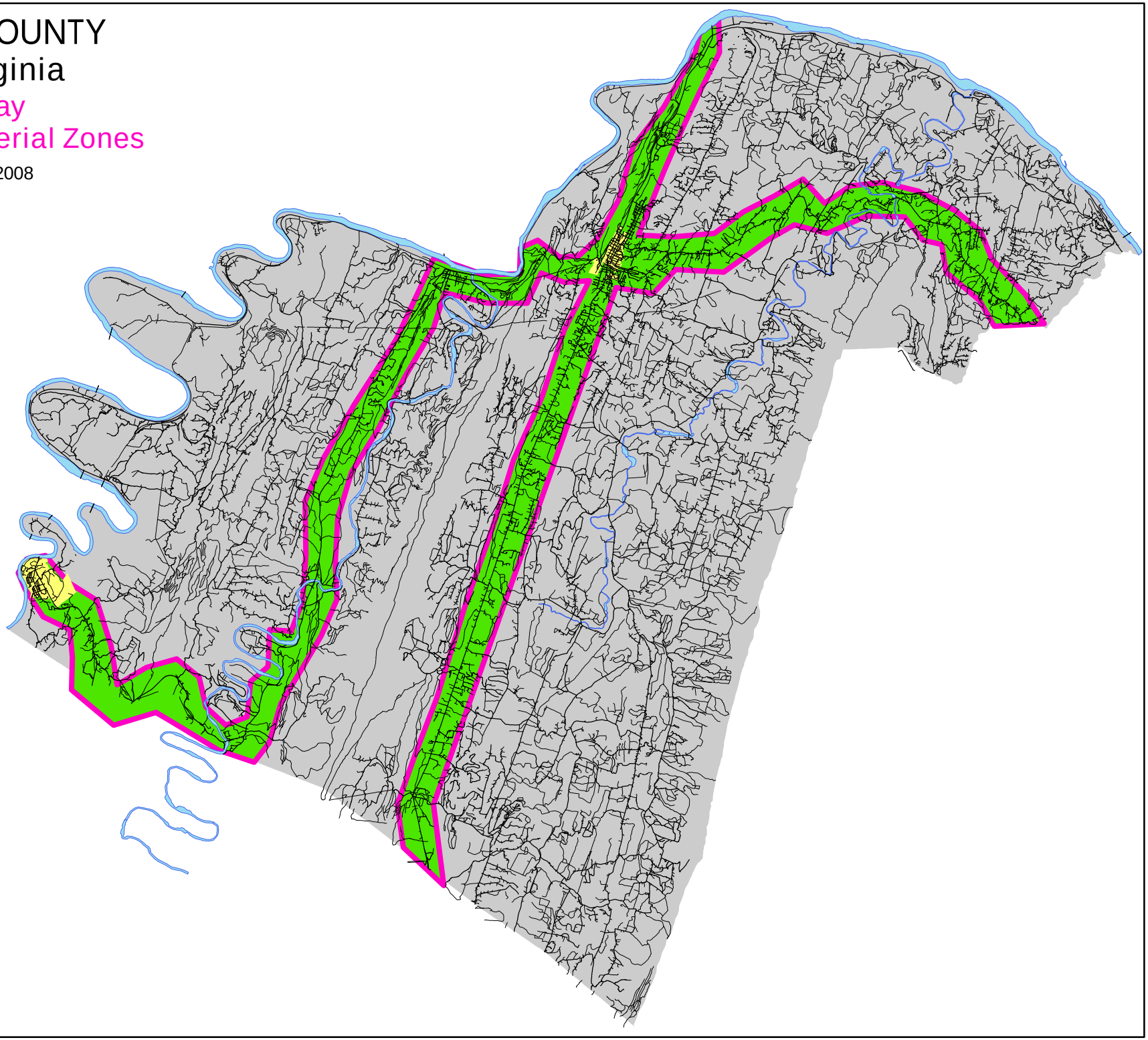
MORGAN COUNTY
West Virginia
Railroad
Hazardous Material Zones

November - 2008



MORGAN COUNTY
West Virginia
Highway
Hazardous Material Zones

November - 2008



Query Results

244 event(s) were reported in **Morgan County, West Virginia** between **01/01/1950** and **07/31/2008** (**High Wind limited to speed greater than 0 knots**).

*Click on **Location or County** to display Details.*

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

West Virginia

Location or County	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
1 MORGAN	04/28/1957	1600	Hail	1.75 in.	0	0	0	0
2 MORGAN	04/20/1963	0155	Tstm Wind	0 kts.	0	0	0	0
3 MORGAN	04/09/1991	1920	Tstm Wind	0 kts.	0	0	0	0
4 MORGAN	05/06/1991	1330	Tstm Wind	0 kts.	0	0	0	0
5 MORGAN	09/18/1991	1440	Tstm Wind	61 kts.	0	0	0	0
6 WVZ001>055	03/15/1993	0700	Record Cold	N/A	0	0	0	0
7 MORGAN	04/16/1993	1810	Hail	0.75 in.	0	0	0	0
8 WVZ001>055	08/01/1993	0000	Hot/dry Pattern	N/A	0	0	0	0
9 WVZ001>055	09/01/1993	0000	Rain	N/A	0	0	0	0
10 Berkeley Springs	09/02/1993	1605	Hail	1.00 in.	0	0	1K	0
11 WVZ001>055	11/14/1993	1100	Record Warmth	N/A	0	0	0	0
12 WVZ001>055	01/18/1994	0000	Extreme Cold	N/A	3	5	5.0M	0
13 Paw Paw	08/17/1994	1515	Tornado	F0	0	0	1K	0
14 MORGAN	08/17/1994	1630	Flood/flash Flood	N/A	0	0	1K	0
15 WVZ001>055	10/01/1994	0000	Dry Pattern	N/A	0	0	0	0
16 WVZ001>055	11/01/1994	0000	Mild/dry Pattern	N/A	0	0	0	0
17 WVZ001>055	12/01/1994	0000	Mild Pattern	N/A	0	0	0	0

18 WVZ001>055	01/12/1995	0000	Record Warmth	N/A	0	0	0	0
19 WVZ051	02/04/1995	0130	Heavy Snow	N/A	0	0	0	0
20 WVZ001>055	02/05/1995	0000	Cold	N/A	0	0	0	0
21 WVZ051	03/08/1995	1930	Heavy Snow	N/A	0	0	0	0
22 MORGAN	07/06/1995	1230	Hail	0.75 in.	0	0	0	0
23 MORGAN	07/06/1995	1300	Thunderstorm Winds	0 kts.	0	0	3K	0
24 MORGAN	07/10/1995	1925	Hail	1.00 in.	0	0	0	5K
25 WVZ051>053	07/14/1995	1200	Excessive Heat	N/A	0	0	0	0
26 MORGAN	07/17/1995	1655	Flash Flood	N/A	0	0	0	0
27 WVZ051	11/14/1995	1130	Heavy Snow	N/A	0	0	36K	0
28 WVZ048>050 - 051>053 - 055	12/13/1995	2100	Winter Weather	N/A	0	0	0	0
29 WVZ051>053	12/19/1995	1500	Ice Storm	N/A	0	0	15K	0
30 WVZ048>055	01/07/1996	01:00 AM	Blizzard	N/A	0	0	0	0
31 WVZ048>055	01/12/1996	07:00 AM	Heavy Snow	N/A	0	0	0	0
32 All	01/19/1996	05:00 AM	Flash Flood	N/A	1	0	500K	0
33 WVZ048>055	01/19/1996	06:00 AM	Flood	N/A	0	0	20.0M	150K
34 WVZ048>055	02/02/1996	11:00 PM	Heavy Snow	N/A	0	0	0	0
35 Southwest Portion	07/30/1996	07:00 PM	Tstm Wind	0 kts.	0	0	20K	0
36 WVZ048>055	09/06/1996	07:00 AM	High Wind	0 kts.	0	0	250K	500K
37 Countywide	09/06/1996	11:00 AM	Flash Flood	N/A	0	0	250K	25K
38 WVZ049>052 - 054>055	12/05/1996	08:00 PM	Heavy Snow	N/A	0	0	0	0
39 WVZ050>053	01/09/1997	11:00 AM	Winter Storm	N/A	0	0	0	0
40 WVZ048>052 - 054>055	01/24/1997	12:00 PM	Winter Weather	N/A	0	0	0	0
41 WVZ048>055	02/08/1997	10:00 AM	Heavy Snow	N/A	0	0	0	0
42 WVZ048>055	02/13/1997	08:00 PM	Winter Weather	N/A	0	0	0	0

43 WVZ050>053	03/06/1997	03:00 AM	Gusty Winds	N/A	0	0	30K	0
44 WVZ048>055	03/31/1997	04:00 PM	Gusty Winds	N/A	0	0	53K	0
45 WVZ048>055	04/10/1997	02:00 AM	Agricultural Freeze	N/A	0	0	0	9.4M
46 WVZ048>053 - 055	07/01/1997	12:00 AM	Drought	N/A	0	0	0	12.4M
47 WVZ051>053	08/16/1997	11:00 AM	Excessive Heat	N/A	0	0	0	0
48 Countywide	11/07/1997	01:00 PM	Flood	N/A	0	0	0	0
49 WVZ048>055	12/29/1997	07:00 PM	Winter Storm	N/A	0	0	0	0
50 WVZ051>053	01/06/1998	07:00 AM	Unseasonably Warm	N/A	0	0	0	0
51 WVZ051>052	01/15/1998	09:00 AM	Winter Weather	N/A	0	0	0	0
52 WVZ049>051 - 055	01/22/1998	10:00 PM	Winter Weather	N/A	0	0	0	0
53 WVZ051>053	01/27/1998	03:00 PM	Winter Weather	N/A	0	0	0	0
54 WVZ048>055	02/04/1998	06:00 AM	Winter Storm	N/A	0	0	12K	0
55 WVZ051	02/23/1998	02:00 PM	Snow	N/A	0	0	0	0
56 WVZ050>053 - 055	02/24/1998	12:00 PM	Gusty Winds	N/A	0	0	0	0
57 WVZ048>053	03/11/1998	07:00 AM	Unseasonably Cold	N/A	0	0	0	0
58 WVZ051>053	03/27/1998	03:00 PM	Unseasonably Warm	N/A	0	0	0	0
59 Countywide	07/21/1998	04:15 PM	Tstm Wind	0 kts.	0	0	12K	5K
60 WVZ051>053	07/21/1998	11:00 AM	Excessive Heat	N/A	0	0	0	0
61 WVZ050>055	08/01/1998	12:00 AM	Drought	N/A	0	0	0	0
62 WVZ048>055	10/01/1998	12:00 AM	Drought	N/A	0	0	0	0
63 WVZ048>055	11/01/1998	12:00 AM	Drought	N/A	0	0	0	0
64 WVZ048>055	12/01/1998	12:00 AM	Drought	N/A	0	0	0	0
65 WVZ048>055	01/02/1999	02:00 PM	Winter Storm	N/A	0	0	0	0
66 WVZ048>055	01/08/1999	02:00 AM	Winter Storm	N/A	0	0	0	0
67 WVZ048>055	01/14/1999	12:00 AM	Ice Storm	N/A	0	0	80K	0

68 WVZ048>049 -051>052	03/03/1999	07:00 PM	Winter Storm	N/A	0	0	0	0
69 WVZ048>055	03/09/1999	02:00 AM	Winter Storm	N/A	0	0	0	0
70 WVZ048>055	03/14/1999	05:00 AM	Winter Storm	N/A	0	0	0	0
71 WVZ048>055	05/01/1999	12:00 AM	Drought	N/A	0	0	0	0
72 WVZ048>055	06/01/1999	12:00 AM	Drought	N/A	0	0	0	0
73 WVZ048>055	06/07/1999	08:00 AM	Unseasonably Warm	N/A	0	3	0	0
74 WVZ048>055	07/01/1999	12:00 AM	Drought	N/A	0	0	0	0
75 WVZ048>055	07/04/1999	04:00 AM	Excessive Heat	N/A	0	3	0	0
76 WVZ048>055	08/01/1999	12:00 AM	Drought	N/A	0	0	0	7.0M
77 WVZ048>055	09/01/1999	12:00 AM	Drought	N/A	0	0	0	0
78 WVZ048>052 -054>055	10/01/1999	12:00 AM	Drought	N/A	0	0	0	0
79 WVZ048>055	01/02/2000	08:00 AM	Unusually Warm	N/A	0	0	0	0
80 WVZ049 - 051	01/16/2000	11:45 AM	High Wind	0 kts.	0	0	30K	0
81 WVZ050>051 -053 - 055	01/20/2000	12:00 AM	Winter Weather	N/A	0	0	0	0
82 WVZ048>055	01/21/2000	12:00 AM	Extreme Windchill	N/A	0	0	0	0
83 WVZ048>055	01/22/2000	12:00 AM	Extreme Cold	N/A	0	0	0	0
84 WVZ051>053	01/25/2000	06:00 AM	Winter Storm	N/A	0	0	0	0
85 WVZ048>055	01/27/2000	12:00 PM	Extreme Cold	N/A	0	0	0	0
86 WVZ048>049 - 051>054	01/30/2000	03:00 AM	Winter Storm	N/A	0	0	0	0
87 WVZ048>055	02/18/2000	03:00 AM	Winter Storm	N/A	0	0	0	0
88 WVZ048>055	03/08/2000	08:00 AM	Unseasonably Warm	N/A	0	0	0	0
89 Countywide	03/21/2000	08:00 AM	Heavy Rain	N/A	0	0	0	0
90 Berkeley Spgs	04/08/2000	12:30 PM	Tstm Wind	0 kts.	0	0	100K	0
91 WVZ048>055	05/06/2000	10:00 AM	Unseasonably Warm	N/A	0	0	0	0
92 WVZ048>055	06/10/2000	08:00 AM	Unseasonably	N/A	0	0	0	0

			Warm					
93 Countywide	06/15/2000	04:00 PM	Heavy Rain	N/A	0	0	0	0
94 Countywide	06/16/2000	04:30 PM	Flash Flood	N/A	0	0	6K	0
95 Great Cacapon	06/16/2000	05:46 PM	Lightning	N/A	0	0	75K	0
96 WVZ048>055	06/25/2000	08:00 AM	Unseasonably Warm	N/A	0	0	0	0
97 Berkeley Spgs	07/28/2000	04:30 PM	Tstm Wind	0 kts.	0	0	1K	0
98 Countywide	08/06/2000	10:00 AM	Heavy Rain	N/A	0	0	0	0
99 Countywide	09/24/2000	12:00 PM	Heavy Rain	N/A	0	0	0	0
100 WVZ050>051 - 053>055	12/12/2000	03:00 AM	Strong Wind	0 kts.	0	0	0	0
101 WVZ049>053 - 055	12/13/2000	06:00 PM	Ice Storm	N/A	0	0	0	0
102 WVZ048>053	12/17/2000	10:00 AM	Strong Wind	0 kts.	0	0	0	0
103 WVZ050>053	12/19/2000	04:00 AM	Winter Storm	N/A	0	0	0	0
104 WVZ048>055	12/22/2000	03:00 PM	Extreme Windchill	N/A	0	0	0	0
105 WVZ048 - 050>053 - 055	01/05/2001	08:00 AM	Winter Weather	N/A	0	0	0	0
106 WVZ048 - 050>053 - 055	01/20/2001	12:00 PM	Winter Storm	N/A	0	0	0	0
107 WVZ048>055	01/27/2001	07:00 AM	Strong Wind	0 kts.	0	0	0	0
108 WVZ048>051 - 053 - 055	02/09/2001	08:00 PM	Strong Wind	0 kts.	0	0	0	0
109 WVZ048>051 - 053	02/22/2001	09:00 AM	Winter Storm	N/A	0	0	0	0
110 WVZ049>054	03/04/2001	02:00 PM	Winter Weather	N/A	0	0	0	0
111 WVZ048>055	03/06/2001	09:00 AM	Strong Wind	0 kts.	0	0	0	0

112 WVZ051	03/21/2001	12:00 AM	Winter Weather	N/A	0	0	0	0
113 Berkeley Spgs	04/09/2001	06:25 PM	Tstm Wind	0 kts.	0	0	1K	0
114 WVZ048>055	04/19/2001	02:00 AM	Unseasonably Cold	N/A	0	0	0	0
115 Countywide	06/07/2001	12:30 AM	Heavy Rain	N/A	0	0	0	0
116 Berkeley Spgs	06/12/2001	04:10 PM	Hail	0.75 in.	0	0	0	0
117 WVZ048>053 - 055	06/12/2001	12:00 PM	Excessive Heat	N/A	0	0	0	0
118 Countywide	06/22/2001	04:00 PM	Heavy Rain	N/A	0	0	0	0
119 WVZ048>053 - 055	06/27/2001	12:00 PM	Excessive Heat	N/A	0	0	0	0
120 Countywide	08/04/2001	03:00 PM	Heavy Rain	N/A	0	0	0	0
121 WVZ048>053 - 055	08/06/2001	08:00 AM	Excessive Heat	N/A	0	0	0	0
122 WVZ048>052 - 054>055	01/06/2002	12:00 PM	Winter Storm	N/A	0	0	0	0
123 WVZ048 - 051>052 - 055	01/19/2002	06:00 AM	Winter Storm	N/A	0	0	0	0
124 WVZ048>055	02/01/2002	12:00 PM	Strong Wind	0 kts.	0	0	0	0
125 WVZ048>052 - 054>055	03/09/2002	09:00 PM	Strong Wind	0 kts.	0	0	20K	0
126 WVZ048>055	03/21/2002	05:00 PM	Strong Wind	0 kts.	0	0	0	0
127 Berkeley Spgs	04/28/2002	04:20 PM	Tstm Wind	0 kts.	0	0	1K	0
128 Berkeley Spgs	05/13/2002	06:40 PM	Tstm Wind	0 kts.	0	0	1K	0
129 Countywide	05/14/2002	02:30 PM	Tstm Wind	0 kts.	0	0	20K	0
130	05/20/2002	04:00 AM	Freeze	N/A	0	0	0	0

WVZ048>055								
131 Berkeley Spgs	05/26/2002	05:21 PM	Hail	1.75 in.	0	0	0	0
132 Berkeley Spgs	05/26/2002	05:37 PM	Hail	1.00 in.	0	0	0	0
133 WVZ048>053 - 055	07/02/2002	10:00 AM	Excessive Heat	N/A	0	0	0	0
134 Central Portion	07/09/2002	04:54 PM	Tstm Wind	0 kts.	0	0	1K	0
135 WVZ048>053 - 055	07/28/2002	10:00 AM	Excessive Heat	N/A	0	0	0	0
136 WVZ048>053 - 055	08/01/2002	10:00 AM	Excessive Heat	N/A	0	0	0	0
137 WVZ048>053 - 055	08/12/2002	10:00 AM	Excessive Heat	N/A	0	0	0	0
138 WVZ048>053 - 055	08/22/2002	10:00 AM	Excessive Heat	N/A	0	0	0	0
139 WVZ048>055	12/05/2002	12:00 AM	Winter Storm	N/A	0	0	0	0
140 WVZ048>055	12/07/2002	12:00 AM	Extreme Cold/wind Chill	N/A	0	0	0	0
141 WVZ048>055	12/11/2002	12:00 AM	Ice Storm	N/A	0	0	0	0
142 WVZ048>055	12/24/2002	04:00 PM	Winter Weather/mix	N/A	0	0	0	0
143 WVZ048 - 050>055	01/05/2003	06:00 AM	Winter Weather/mix	N/A	0	0	0	0
144 WVZ048>052 - 054>055	01/08/2003	10:00 PM	High Wind	58 kts.	0	0	0	0
145 WVZ048>049 - 051 - 053>055	02/06/2003	07:00 PM	Winter Weather/mix	N/A	0	0	0	0
146 WVZ048>055	02/14/2003	08:00 AM	Winter Storm	N/A	0	1	7.6M	0

147 WVZ048 - 050>053 - 055	02/22/2003	08:00 AM	Flood	N/A	0	0	0	0
148 WVZ048>055	02/23/2003	06:00 AM	Strong Wind	30 kts.	0	0	1K	0
149 WVZ048>055	02/26/2003	06:00 AM	Winter Weather/mix	N/A	0	0	0	0
150 WVZ050>051 - 055	03/20/2003	02:15 PM	Flood	N/A	0	0	0	0
151 WVZ048>051 - 054>055	03/30/2003	05:00 AM	Winter Storm	N/A	0	0	0	0
152 Countywide	05/15/2003	03:00 PM	Heavy Rain	N/A	0	0	0	0
153 Countywide	05/31/2003	01:30 PM	Flash Flood	N/A	0	0	0	0
154 Countywide	06/07/2003	06:00 AM	Heavy Rain	N/A	0	0	0	0
155 Countywide	08/22/2003	03:40 PM	Flash Flood	N/A	0	0	0	0
156 Countywide	08/26/2003	02:45 PM	Tstm Wind	50 kts.	0	0	2K	0
157 Countywide	09/03/2003	07:00 PM	Heavy Rain	N/A	0	0	0	0
158 WVZ048>055	09/18/2003	03:00 PM	Flood	N/A	0	0	645K	0
159 WVZ048>055	09/18/2003	04:00 PM	High Wind	50 kts.	0	3	780K	290K
160 WVZ048>053 - 055	10/15/2003	05:00 AM	Strong Wind	43 kts.	0	0	21K	0
161 WVZ048>055	11/13/2003	04:00 AM	Strong Wind	50 kts.	0	0	30K	0
162 WVZ049>053	12/04/2003	07:00 PM	Winter Storm	N/A	0	0	0	0
163 WVZ051	12/05/2003	09:00 PM	Winter Storm	N/A	0	0	0	0
164 WVZ050>052	12/11/2003	05:00 AM	Flood	N/A	0	0	0	0
165 WVZ048>052 - 054>055	12/14/2003	03:00 AM	Winter Storm	N/A	0	0	0	0
166 WVZ051>053	01/10/2004	01:00 AM	Extreme Cold/wind Chill	N/A	0	0	0	0

167 WVZ051>053	01/15/2004	11:00 PM	Extreme Cold/wind Chill	N/A	0	0	0	0
168 WVZ051>053	01/17/2004	06:00 PM	Winter Weather/mix	N/A	0	0	0	0
169 WVZ048>053	01/23/2004	07:00 PM	Winter Storm	N/A	0	0	0	0
170 WVZ048>055	01/25/2004	12:00 PM	Winter Storm	N/A	0	0	0	0
171 WVZ051>053	01/31/2004	03:00 AM	Extreme Cold/wind Chill	N/A	0	0	0	0
172 WVZ051	02/03/2004	03:00 AM	Winter Weather/mix	N/A	0	0	0	0
173 WVZ051>052	02/05/2004	05:00 PM	Winter Weather/mix	N/A	0	0	0	0
174 WVZ048 - 050>053 - 055	02/06/2004	02:00 PM	Flood	N/A	0	0	0	0
175 Stotlers Xrds	05/18/2004	06:05 PM	Tstm Wind	50 kts.	0	0	2K	0
176 Countywide	05/21/2004	07:30 PM	Tstm Wind	55 kts.	0	0	3K	0
177 Omps	06/01/2004	12:15 PM	Tstm Wind	55 kts.	1	0	0	0
178 Berkeley Spgs	08/04/2004	04:16 PM	Tstm Wind	50 kts.	0	0	0	0
179 Berkeley Spgs	09/08/2004	07:00 PM	Flash Flood	N/A	0	0	0	0
180 Berkeley Spgs	09/17/2004	07:00 PM	Flash Flood	N/A	0	0	0	0
181 Sleepy Creek	09/17/2004	07:34 PM	Tornado	F0	0	0	25K	0
182 WVZ051>052	09/17/2004	10:00 PM	Flood	N/A	0	0	0	0
183 Berkeley Spgs	09/28/2004	02:15 PM	Flash Flood	N/A	0	0	0	0
184 WVZ048>052 - 054>055	12/01/2004	06:50 AM	High Wind	50 kts.	0	0	0	0
185	01/22/2005	07:00 AM	Winter Storm	N/A	0	0	0	0

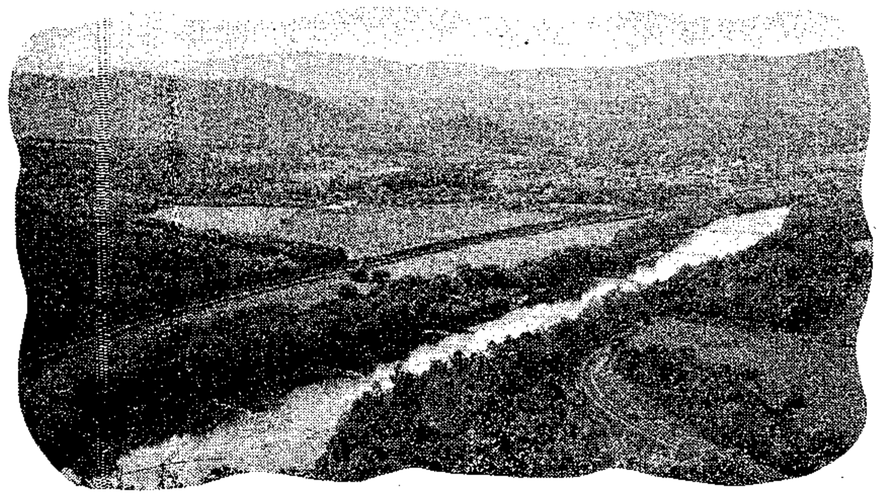
WVZ051>052								
186 WVZ048>053	02/24/2005	11:00 AM	Winter Storm	N/A	0	0	0	0
187 WVZ048>055	02/28/2005	09:00 PM	Winter Storm	N/A	0	0	0	0
188 WVZ048>051 - 054>055	04/03/2005	10:00 AM	High Wind	50 kts.	1	2	0	0
189 WVZ051 - 055	11/29/2005	05:30 PM	Flood	N/A	0	0	50K	0
190 WVZ048>052	12/09/2005	02:00 AM	Heavy Snow	N/A	0	0	0	0
191 WVZ048>049 - 051	12/15/2005	07:00 PM	Winter Storm	N/A	0	0	0	0
192 WVZ048>055	12/26/2005	02:00 AM	Dense Fog	N/A	0	0	0	0
193 WVZ048>055	01/14/2006	06:00 PM	High Wind	50 kts.	0	0	640K	0
194 WVZ048>055	02/11/2006	05:00 PM	Heavy Snow	N/A	0	0	0	0
195 WVZ048>055	02/23/2006	03:00 AM	Dense Fog	N/A	0	0	0	0
196 WVZ048>055	05/23/2006	03:00 AM	Frost/freeze	N/A	0	0	0	0
197 Countywide	06/27/2006	04:00 PM	Flash Flood	N/A	0	0	8K	0
198 Berkeley Spgs	07/18/2006	03:18 PM	Hail	1.00 in.	0	0	0	0
199 Berkeley Spgs	07/18/2006	04:30 PM	Hail	2.50 in.	0	0	750K	0
200 Berkeley Spgs	07/18/2006	04:35 PM	Tstm Wind	50 kts.	0	0	13K	0
201 Berkeley Spgs	07/18/2006	06:02 PM	Hail	1.00 in.	0	0	0	0
202 Berkeley Spgs	07/18/2006	07:13 PM	Flash Flood	N/A	0	0	125K	0
203 WVZ051>053	08/01/2006	01:00 PM	Heat	N/A	0	0	0	0
204	09/09/2006	05:00 AM	Dense Fog	N/A	0	0	0	0

WVZ049>053								
205 Berkeley Spgs	09/28/2006	03:00 PM	Tstm Wind	60 kts.	0	0	85K	0
206 WVZ048>055	10/13/2006	02:00 AM	Frost/freeze	N/A	0	0	0K	0K
207 WVZ048>055	10/18/2006	03:00 AM	Dense Fog	N/A	0	0	0K	0K
208 WVZ050>055 - 501>502 - 504	02/12/2007	22:00 PM	Winter Storm	N/A	0	0	0K	0K
209 WVZ050>055 - 501>502 - 504	02/12/2007	22:00 PM	Winter Weather	N/A	0	0	0K	0K
210 WVZ051	02/22/2007	20:00 PM	Strong Wind	45 kts.	0	0	2K	0K
211 WVZ050>053 - 055 - 504	02/24/2007	20:00 PM	Winter Storm	N/A	0	0	0K	0K
212 WVZ050>053 - 055 - 504	02/24/2007	20:00 PM	Winter Weather	N/A	0	0	0K	0K
213 WVZ050>053 - 055 - 501	03/07/2007	00:00 AM	Winter Storm	N/A	0	0	0K	0K
214 WVZ050>053 - 055 - 501	03/07/2007	00:00 AM	Winter Weather	N/A	0	0	0K	0K
215 WVZ050>055 - 501	03/16/2007	05:00 AM	Winter Storm	N/A	0	0	0K	0K
216 WVZ050>055 - 501	03/16/2007	05:00 AM	Winter Weather	N/A	0	0	0K	0K
217 WVZ050>055 - 501	04/06/2007	00:00 AM	Frost/freeze	N/A	0	0	0K	0K
218 WVZ050>055 - 501	04/07/2007	00:00 AM	Frost/freeze	N/A	0	0	0K	0K
219 WVZ050>055 -	04/08/2007	00:00 AM	Frost/freeze	N/A	0	0	0K	0K

501								
220 WVZ050>055 - 501	04/09/2007	00:00 AM	Frost/freeze	N/A	0	0	0K	0K
221 WVZ050>055 - 501	04/10/2007	00:00 AM	Frost/freeze	N/A	0	0	0K	0K
222 Berkeley Spgs	04/15/2007	07:00 AM	Flood	N/A	0	0	0K	0K
223 WVZ050>055 - 501	05/11/2007	01:00 AM	Dense Fog	N/A	0	0	0K	0K
224 Berkeley Spgs	06/01/2007	19:15 PM	Thunderstorm Wind	50 kts.	0	0	2K	0K
225 Berkeley Spgs	06/12/2007	18:38 PM	Thunderstorm Wind	50 kts.	0	0	0K	0K
226 Berkeley Spgs	06/13/2007	17:30 PM	Thunderstorm Wind	50 kts.	0	0	1K	0K
227 Omps	06/19/2007	14:10 PM	Hail	1.75 in.	0	0	0K	0K
228 Berkeley Spgs	06/21/2007	15:51 PM	Thunderstorm Wind	50 kts.	0	0	1K	0K
229 Berkeley Spgs	09/27/2007	16:14 PM	Thunderstorm Wind	50 kts.	0	0	5K	0K
230 WVZ050>053 - 501	12/05/2007	08:00 AM	Heavy Snow	N/A	0	0	0K	0K
231 WVZ050>053 - 501	12/05/2007	08:00 AM	Winter Weather	N/A	0	0	0K	0K
232 WVZ050>055 - 501	12/15/2007	16:00 PM	Winter Storm	N/A	0	0	5K	0K
233 WVZ051 - 501	12/16/2007	20:30 PM	High Wind	50 kts.	0	0	5K	0K
234 WVZ050>055 - 501	01/17/2008	08:00 AM	Winter Weather	N/A	0	0	0K	0K
235 WVZ050>055 - 501	02/01/2008	00:00 AM	Ice Storm	N/A	0	0	0K	0K

236 WVZ050>055 - 501	02/01/2008	00:00 AM	Winter Weather	N/A	0	0	0K	0K
237 WVZ050 - 051	02/10/2008	15:00 PM	High Wind	50 kts.	0	0	10K	0K
238 WVZ050>053 - 055 - 501	02/12/2008	03:00 AM	Winter Storm	N/A	0	0	0K	0K
239 WVZ050>053 - 055 - 501	02/12/2008	03:00 AM	Winter Weather	N/A	0	0	0K	0K
240 WVZ050>055 - 501	02/20/2008	06:00 AM	Heavy Snow	N/A	0	0	0K	0K
241 WVZ050>055 - 501	02/20/2008	06:00 AM	Winter Weather	N/A	0	0	0K	0K
242 WVZ051 - 052	02/22/2008	00:00 AM	Winter Weather	N/A	0	0	0K	0K
243 Berkeley Spgs	04/21/2008	05:00 AM	Flood	N/A	0	0	5K	0K
244 Johnsons Mill	05/12/2008	04:00 AM	Flood	N/A	0	0	0K	0K
				TOTALS:	6	17	37.333M	29.755M

Top of Page



Morgan County Commission

P.O. Box 28
Berkeley Springs, West Virginia 25411
258-8540

-COMMISSIONERS-

THOMAS R. SWAIM
2478 FAIRVIEW DRIVE
BERKELEY SPRINGS
WV 25411
258-3109

BRENDA J. HUTCHINSON
5154 MILO SCHOOL ROAD
GREAT CACAPON
WV 25422
947-7713

GLEN R. STOTLER
706 MONTE VISTA LANE
BERKELEY SPRINGS
WV 25411
258-3540

RESOLUTION

WHEREAS; The County Commission of Morgan County recognizes the threat that natural hazards pose to people and property; and

WHEREAS; Undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS; An adopted Hazard Mitigation Plan is required as a condition of future grant funding for mitigation projects; and

WHEREAS; Morgan County participated jointly in the planning process with other local units of government within the County to prepare a Hazard Mitigation Plan;

THEREFORE, BE IT RESOLVED; This 21st day of November, 2008 the Morgan County Commission hereby adopts the updated Morgan County Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED; That the Morgan County Commission will submit on behalf of the participating municipalities the adopted Hazard Mitigation Plan to Federal Emergency Management officials for final review and approval.

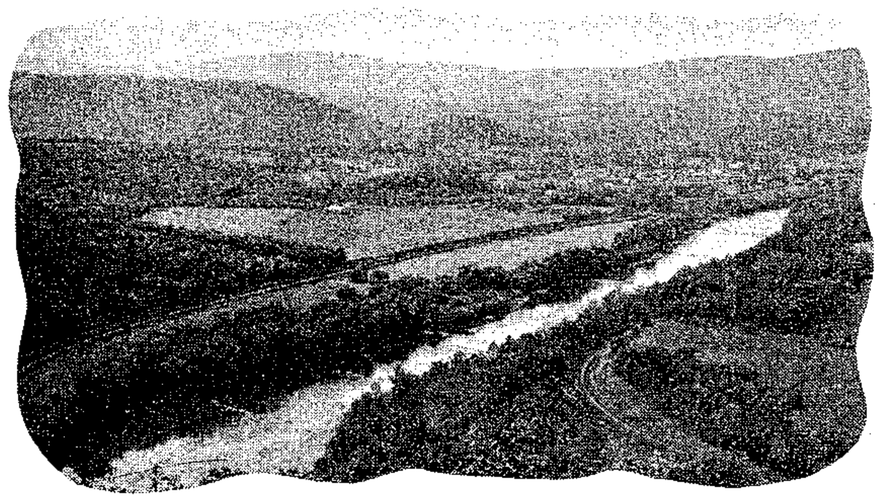
Glen R. Stotler, President
Morgan County Commission

Thomas R. Swaim
Morgan County Commission

Brenda J. Hutchinson
Morgan County Commission

ATTEST:
Debra Kesecker,
Clerk of the County Commission

Appendix J



Morgan County Commission

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706 MONTE VISTA LANE
BERKELEY SPRINGS
WV 25411
258-3540

November 21, 2008

Mayor Webster and Town Council
Town of Bath
271 Wilkes Street, Suite A
Berkeley Springs, WV 25434

Re: Disaster Mitigation Act of 2000
Update of the Morgan County Hazard Mitigation Plan

Dear Mayor Webster and Council;

Section 322 of the Disaster Mitigation Act of 2000 requires county and local governments to prepare mitigation plans in order to be eligible to receive funding under the Hazard Mitigation Grant Program (HMGP). In November of 2003, Morgan County adopted a hazard mitigation plan that was also approved as a multi-jurisdictional plan by both municipalities. It is a requirement that this plan be updated every 5 years and be submitted to the West Virginia Division of Homeland Security by November 30, 2008 to continue our eligibility for state and federal funding. At their meeting held November 21, 2008, the Morgan County Commission adopted the updated hazard mitigation plan for Morgan County.

It is our desire to continue to include the Town of Bath in our county wide hazard mitigation plan. In order for that to occur, the West Virginia Division of Homeland Security requires that we include in our plan a signed copy of the enclosed Letter of Agreement committing to participate in the multi-jurisdictional plan and that the community agrees to adopt the updated plan upon approval by FEMA. I have enclosed a copy of the plan along with the resolution passed by the County Commission for your review and consideration. I have also enclosed a copy of a sample resolution for Town Council to consider.

Should you have any questions, concerns or desire additional information regarding this matter, please feel free to contact me at my office. Thank you for your time.

Sincerely,

Alma E. Gorse
County Planner

COPY

RESOLUTION

WHEREAS; The Town of [redacted]w/Bath of Morgan County recognizes the threat that natural hazards pose to people and property; and

WHEREAS; Undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS; An adopted hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

THEREFORE, BE IT RESOLVED; This 17th day of Sept, 2003, that the Town of [redacted]w/Bath hereby adopts the Morgan County Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED; That the Morgan County Commission will submit on behalf of the participating municipalities the adopted Hazard Mitigation Plan to Federal Emergency Management officials for final review and approval.

Susan J. Webster

Mayor

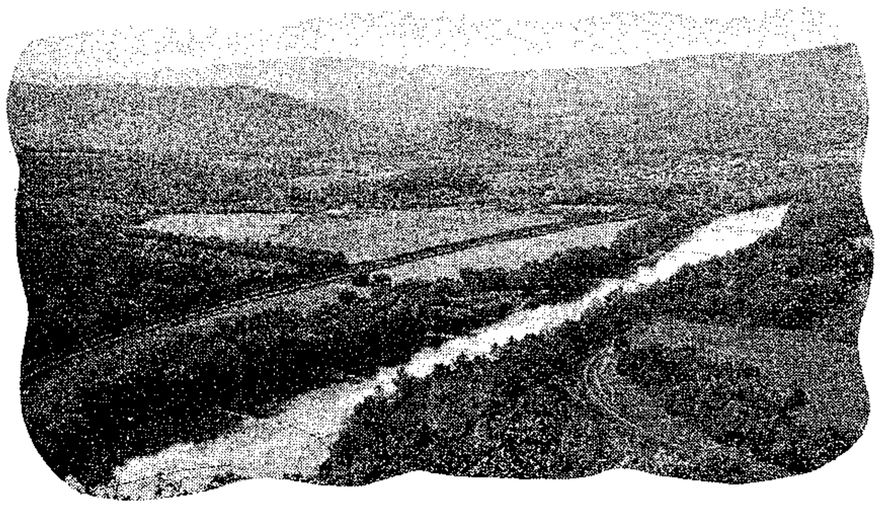
David M. Hall

RECORDER.

Town Council Members

DALE LUTMAN

Sample



Morgan County Commission

P.O. Box 28
Berkeley Springs, West Virginia 25411
258-8540
-COMMISSIONERS-

THOMAS R. SWAIM
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BERKELEY SPRINGS
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947-7713

GLEN R. STOTLER
706 MONTE VISTA LANE
BERKELEY SPRINGS
WV 25411
258-3540

November 21, 2008

Mayor Crites and Town Council
Town of Paw Paw
P.O. Box 35
Paw Paw, WV 25434

Re: Disaster Mitigation Act of 2000
Update of the Morgan County Hazard Mitigation Plan

Dear Mayor Crites and Council;

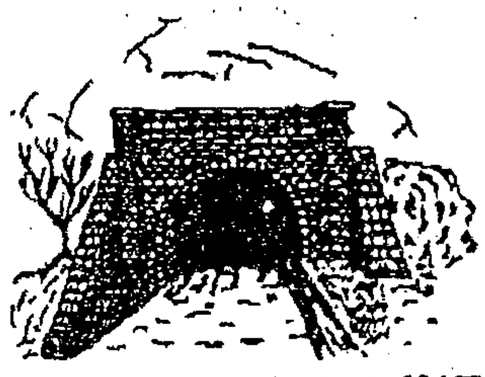
Section 322 of the Disaster Mitigation Act of 2000 requires county and local governments to prepare mitigation plans in order to be eligible to receive funding under the Hazard Mitigation Grant Program (HMGP). In November of 2003, Morgan County adopted a hazard mitigation plan that was also approved as a multi-jurisdictional plan by both municipalities. It is a requirement that this plan be updated every 5 years and be submitted to the West Virginia Division of Homeland Security by November 30, 2008 to continue our eligibility for state and federal funding. At their meeting held November 21, 2008, the Morgan County Commission adopted the updated hazard mitigation plan for Morgan County.

It is our desire to continue to include the Town of Paw Paw in our county wide hazard mitigation plan. In order for that to occur, the West Virginia Division of Homeland Security requires that we include in our plan a signed copy of the enclosed Letter of Agreement committing to participate in the multi-jurisdictional plan and that the community agrees to adopt the updated plan upon approval by FEMA. I have enclosed a copy of the plan along with the resolution passed by the County Commission for your review and consideration. I have also enclosed a copy of a sample resolution for Town Council to consider.

Should you have any questions, concerns or desire additional information regarding this matter, please feel free to contact me at my office. Thank you for your time.

Sincerely,

Alma E. Gorse
Morgan County Planner



C & O CANAL TUNNEL

TOWN OF PAW PAW

205 WINCHESTER STREET
P. O. BOX 35
WEST VIRGINIA 25434
Phone (304) 947-7476 • Fax: (304) 947-5373
Email: pawpawwv@intrepid.net

COPY

RESOLUTION

WHEREAS; The Town of Paw Paw of Morgan County recognizes the threat that natural hazards pose to people and property; and

WHEREAS; Undertaking hazard mitigation actions before disasters occur will reduce the potential for harm to people and property and save taxpayer dollars; and

WHEREAS; An adopted hazard mitigation plan is required as a condition of future grant funding for mitigation projects; and

THEREFORE, BE IT RESOLVED; This 6th day of October, 2003, that the Town of Paw Paw hereby adopts the Morgan County Hazard Mitigation Plan as an official plan; and

BE IT FURTHER RESOLVED; That the Morgan County Commission will submit on behalf of the participating municipalities the adopted Hazard Mitigation Plan to Federal Emergency Management officials for final review and approval.

Charles A Gordon
Mayor

Frank R Haberam Jr.
Town Council Member

Town Council Member

Town Council Member

Town Council Member

Town Council Member

Attest Seal

Janice B. Herrell
Recorder

MCLEPC Mtg

MORGAN COUNTY HAZARD MITIGATION PLAN
PUBLIC FORUM MEETINGS
SIGN-IN SHEET

DATE 11.3.08

Name	Address	E-Mail Address
1. Mary L. Hook	MCHD	mary.hook@wvdhhr.org
2. Lee Fowler	MCHD	
3. Lee Ann Beihl	War Memorial	LBEIHL@VALLEYHEALTHLINK.co
4. DAVID A. MICHAEL	OES	morgancountyWVOES@VERIZON.NET
5. David L. Cutlip		Morgan Co. 911
6. Rebecca Macleod	35 Pendleton Dr	rebecca.macleod@wv.usda.gov
7.		
8.		
9.		
10.		
11. ALMA GORSE		MCC
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

MORGAN COUNTY HAZARD MITIGATION PLAN
PUBLIC FORUM MEETINGS
SIGN-IN SHEET

DATE 11.18.08

Name	Address	E-Mail Address
1. Robert Lawhorne		bigfiredawg9@yahoo.com
2. ROBERT RAYNOR		RRAYNOR390@AOL.COM
3. Dan L Collins		Morgan Co. 911
4. DAVID A. MICHAEL		OES
5. Tim Seims		Hazard@postal-services.com
6.		
7.		
8. Anna Case		MCC
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

West side of U.S. Route 522, being a corner to Annalea Dawson (Will book 11 Page 564-Db. 142 Pg. 297); thence, leaving said Dawson and running with the west side of the road, S 27 deg. 39' 33" W, 508.04 feet to a T-Bar, found; thence leaving said road, N 34 deg. 40' [illegible]" W, 51.48 feet to a T-Bar, found, being [illegible]other corner to said Dawson; thence, with same, N 24 deg. 57' 58" E, 487.27 feet to an iron rod, found; thence, S 60 deg. 10' 27" E, 68.56 feet to the point of beginning, containing 0.65 acres."

Map/Parcel: 1/10.3

The above description is also known as 9162 Valley Road, Berkeley Springs, WV 25411.

PROPERTY ADDRESS: **9162 Valley Road, Berkeley Springs, WV 25411**

Property is sold subject to prior trusts, encumbrances, restrictions and easements of records, if any. The property is sold subject to an accurate survey at purchaser's expense.

FEDERAL TAX LIEN: In the event that there are Federal Tax Liens against the property, the United States would have the right to redeem the property within a period of 120 days from the date of such sale or the period allowable for redemption under local law, whichever is longer.

TERMS OF SALE: A deposit of $8,000.00 by certified check or cashier's check at sale made payable to Mancini & Associates, the balance in cash or by certified check at closing. Certified funds must be presented to Trustee for inspection at start of sale in order to be qualified to bid. Conveyance will be by Special Warranty Deed subject to all easements, covenants, rights-of-way, conditions and restrictions of record. The property is sold in "as is" condition. The beneficial owner of the Deed of Trust does not make any representations or warranties as to the physical [illegible]on of the property. Any and all legal procedural requirements to obtain physical possession of the premises after the closing are the responsibility of the purchaser. Risk of loss or damage will be purchasers from and after the foreclosure sale. All taxes and utility charges will be the responsibility of the purchaser. All settlement fees, costs of conveyance, examination of title, recording charges, and transfer taxes are at the expense of the purchaser. The purchaser will be required to complete settlement within 30 days of the date of the sale, failing which the deposit made will be forfeit and the property resold at the risk and expense of the purchaser. Trustee makes no representations regarding state of title. If Trustee cannot convey insurable or marketable title, purchaser's sole remedy is a return of deposit. The Trustee reserves the right to continue sale of the subject property from time to time by oral proclamation, which continuation shall be in the sole discretion of the Trustee.

Connie Kesner, Substitute Trustee
Mancini & Associates
201A Fairview Drive
Monaca, PA 15061
Phone 724-728-3178
Fax 724-728-3179
10-29-2tm

Deadline Notice

All correspondents and advertisers are reminded the deadline for submitting copy to this publication is 12:00 Noon Monday each week.

10/29/08

MORGAN COUNTY HAZARD MITIGATION PLAN PUBLIC FORUMS NOVEMBER 3, 2008 AND NOVEMBER 10, 2008

3:00 p.m. – Morgan County Public Library

The public is invited to attend these meetings to comment on the Morgan County Hazard Mitigation Plan currently being updated in compliance with Federal Emergency Management Agency local hazard mitigation planning regulations. Copies of the plan are available at the County Commission Office. If you have any questions, please contact Alma Gorse at the Morgan County Commission Office at 304-258-8540.

10-29-2tm

SPECIAL THANKS

I would like to say thank you to the Morgan County Sheriff's Department, West Virginia State Police Department and to the good citizens whom called with information. With everyone's assistance I was able to recover my stolen utility trailer and other items.

Appendix M

Thanks Again, Dennis Beddow

September 4, 1996, and amended. The public is invited to participate in this review to be held Tuesday, December 9, 2008, beginning at 7:00 p.m. in the County Commission Room, Morgan County Courthouse Complex, Berkeley Springs, WV.

11-5-2tm

any existing tenant or person occupying the subject property to vacate said property.

TERMS: Ten percent (10%) of the purchase price as a cash deposit with the balance due and payable within 30 days of the day of sale.

Richard A. Pill, Substitute Trustee
P.O. Box 440, 85 Aikens Center,
Martinsburg, WV 25404
Phone (304) 263-4971
Fax (304) 267-5840
e-mail:
pillforeclosures@earthlink.net
11-5-3tm

trust, the Trustee(s) may postpone the sale by public announcement at the time and place designated for the sale, The West Virginia Housing Development Fund or its designee may purchase the property at any sale.

The Substituate Trustees shall be under no duty to cause any existing tenant or person occupying the property to vacate said property, and any personal property and/or belongings remaining at the property after the foreclosure sale will be deemed to constitute ABANDONED PROPERTY AND WILL BE DISPOSED OF ACCORDINGLY.

TERMS OF SALE: Cash in hand on day of sale.

DATED this 29th day of October, 2008.

Richard A. Pill
Substitute Trustee
304-263-4971
Lew G. Tyree
Substitute Trustee
304-345-6475
11-5-2tm

bidding proposals will be notified of such deferment, delay or postponement and the date that proposals will be received and publicly opened.

The West Virginia Department of Transportation, Division of Highways hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, religion, sex or national origin in consideration for an award.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
Division of Highways
Robert L. Pennington, P.E.
Director of Program Planning
and Administration
11-5-2tm

NOTICE

THE MORGAN COUNTY COURTHOUSE WILL BE CLOSED ON TUESDAY, NOVEMBER 11 IN OBSERVANCE OF VETERANS DAY

MORGAN COUNTY HAZARD MITIGATION PLAN PUBLIC FORUMS NOVEMBER 3, 2008 AND NOVEMBER 10, 2008

3:00 p.m. – Morgan County Public Library

The public is invited to attend these meetings to comment on the Morgan County Hazard Mitigation Plan currently being updated in compliance with Federal Emergency Management Agency local hazard mitigation planning regulations. Copies of the plan are available at the County Commission Office. If you have any questions, please contact Alma Gorse at the Morgan County Commission Office at 304-258-8540.

11/5/08

10-29-2tm

BOOKMARK THE MORGAN MESSENGER WEB SITE:
www.morganmessenger.com

THE MORGAN COUNTY BOARD OF HEALTH

Will Host a Meeting on
Monday, November 17
at 4:30 p.m.
in the Conference Room at the Health Department

The purpose of this meeting is to discuss well and septic permitting in the floodplains of Morgan County. If you wish to make a presentation at this meeting, please contact the administrator, Lee Fowler at 304-258-1513.

11-5-2tm

11·5·08

ıgs Vol.)ctober

r investigation, 2700 ıchester Grade Road.
control, 9500 block ad.
rmer fire, Dawson

hicle accident, 5800 ey Road.
South Morgan Fire it.
20 - Helicopter 'ar Memorial Drive.
21 - Fire preven- Warm Springs te School.
ident, 11,000 block d.
vestigation, 9000 y Road.
fire, 2700 block er Road.
22 - Public service or- -s High School

23 - Mutual aid tation 45.
fire, Dad's Lane.
24 - Medic assist,

assist, 200 N. Street.
5 - Auto accident, Martinsburg Road.
6 - Training.
7 - Auto accident, on Street.
lent, Valley Road chery Road.
8 - Heater mal- rtinsburg Road.
s down, cancelled

- Auto accident, Martinsburg Road.
rvice Hancock

to Washington elled en route.
- Auto accident, alley Road.
fire Morgan

- Auto accident, l.
ent, 400 block ge Road.
le accident, 700 Street.
accident, 10,000 urg Road.

Public comment sought on updated county disaster plan

by Kate Evans

The Morgan County disaster plan is being updated in compliance with the Federal Emergency Management Agency (FEMA) and the West Virginia Division of Homeland Security and Emergency Management requirements. Public comments are being sought on the plan.

A public forum regarding the county's disaster plans was held on Monday, November 3 at the Morgan County Public Library. Another public forum is scheduled for this Monday, November 10 at 3 p.m. at the library.

The county's plans for dealing with natural and manmade hazards include a risk assessment for vulnerability to potential disasters such as floods, hurricanes, winter storms, tornados, wind storms, severe thunderstorms and lightning, hail storms, drought, earthquake, wildfires and urban fires.

The disaster plan also lists goals, objectives and strategies for reducing current and future risks from hazards, improving emergency preparedness in the county and decreasing the impact of natural and manmade disasters on private property and county historic sites.

In 2003, the Division of Homeland Security required the county to put together a disaster plan so it could be eligible for state grants and disaster assistance, said County Planner Alma Gorse. She and Emergency Services Director Dave Michael created a hazard mitigation plan which needs to be updated and renewed every five years.

The disaster plan includes maps and lists of critical infrastructure such as fire departments and bridges, Gorse said.

The plan discusses what strategies the county wants to work on, such as improving enforcement of floodplain regulations and planning regulations, she said.

An implementation schedule of objectives was also established. As objectives are met, the plan is revised and new goals are added, Gorse said. The 2003 goal of updating the emergency operations plan has been accomplished, she said.

Copies of the Morgan County Hazard Mitigation Plan are available at the Morgan County Commission Office for review. For more information, contact Gorse at 258-8540.

Sobriety check Friday

West Virginia State Police will be conducting a sobriety checkpoint on Friday, November 7, between 7 p.m.

Magistrates Report

Recent sentences by Magistrate Kermit Ambrose:

Thomas Davis, 50, of Terry's Road, Berkeley Springs, was sentenced to a year in jail and ordered to pay $1,594 in fines & court costs

On the public dock

All local government meetings are open to the public.

Morgan County Government

Thursday, November 6. Morgan County Commissioners meet with Valley Health System representatives in special session to discuss Valley's Health's bid proposal for War Memorial Hospital. 1:30 p.m.

Friday, November 7. Morgan County Commissioners meet. 9:30 a.m.

Monday, November 10. Morgan County Commissioners canvass and certify vote from the General Election. 9 a.m.

Monday, November 10. Discussion of Morgan County Hazard Mitigation Plan, now being updated to comply with Federal Emergency Management Agency policies. 3 p.m. *For information, contact County Planner Alma Gorse, 304-258-8540.*

Monday, November 10. Morgan County Solid Waste Authority meets. 7 p.m.

Tuesday, November 11. County, state and federal government offices closed for **Veterans Day**.

Wednesday, November 12. Warm Springs Sewer System board meets. 3:30 p.m.

Monday, November 17. Morgan County Commissioners meet with WVU Hospital representatives in special session to discuss correspondence received from them related to the possible sale of War Memorial Hospital. 9:30 a.m.

Monday, Nov Sheriff's tax sa estate for delinq Sheriff's Tax D 10 a.m.-4 p.m.

Monday, Nov Morgan County Health meets Department. 4:30

Tuesday, Nov County Lan Committee m Cacapon Lodge. 7

Morgan Co Schools

Tuesday, Nove Schools closed fo **Day**.

Tuesday, Nove Morgan County Board meets. 7 p.

Bath Town C

Town of Bath meets the first Tuesdays of the m p.m. in town hall.

Tuesday, Nove Town St Committee meets.

Tuesday, Nove Bath Town Counci p.m.

Paw Paw Town Coun

Paw Paw Town meets the first M each month at 7:3 town hall.

Next meeting: December 1, 7:30 p

Morgan Cou Recycling

Saturday, Nove Great Cacapon fro to 11 a.m., and P from noon to 2 p.m.

Tuesday, Noven U.S. 522 Business a.m.-11 a.m.

Saturday, Noven Widmyer Ele School, Berkeley Sp a.m.-noon.

Community Name	Address Line 1	Address Line 2	City	Zip Code
BATH, TOWN OF		19-23 S MAIN ST	Berkeley Springs	254110000
MORGAN COUNTY*	VIS LOT 36B	VIS LOT 36B	GREAT CACAPON	254220000
MORGAN COUNTY*		APPROX 7 MI S OF GREAT CACOPON	GREAT CACOPON	254220000
MORGAN COUNTY*		47 AC L85 F660 LOT 36	MAGNOLIA	26505
MORGAN COUNTY*		BRIARY BTM	GREAT CACAPON	254220000
MORGAN COUNTY*	CAPON RIVER VIS	LOT B-27	GREAT CACAPON	25422
MORGAN COUNTY*		CACAPON RIVER MDWS LOT 11	GREAT CACAPON	254220000
MORGAN COUNTY*	CACAPON RIVER ESTS LOT 11	CACAPON RIVER ESTS LOT 11	GREAT CACAPON	254220000
MORGAN COUNTY*	CACAPON RIVER MDWS LOT 12	CACAPON RIVER MDWS LOT 12	GREAT CACAPON	254220000
MORGAN COUNTY*	CACAPON RIVER RPDS LOT 23	CACAPON RIVER RPDS LOT 23	GREAT CACAPON	254220000
MORGAN COUNTY*		CACPN RIVER MDWS LOT 24	GREAT CACAPON	25422
MORGAN COUNTY*		CACAPON RIVER MDW LOT 25	GREAT CACAPON	254220000
MORGAN COUNTY*		CACAPON RIVER RPDS LOT 25	GREAT CACAPON	254220000
MORGAN COUNTY*		LOTS 5 & 6 CACAPON DIST	NEPTUNE BEACH	254220000
MORGAN COUNTY*	E S RT 9 2/5 MI S OF	CACAPON RETREAT LOTS 6/7 8	GREAT CACAPON	254220000
MORGAN COUNTY*	487 RUNNING WATER WAY	CACAPON RIVER RPDS LOT 27	GREAT CACAPON	254220000
MORGAN COUNTY*		1253 CONSTANT RD	GREAT CACAPON	254220000
MORGAN COUNTY*		DAVID BRIDGES N S OF RT 9 20	8 MI EAST OF P	254340000
MORGAN COUNTY*	CACAPON RIVER COLONY SUB	ROUTE 7 (ELEVATED BLDG NO ENCL	GREAT CACAPON	21144
MORGAN COUNTY*		6 W OF FISHER BRG	GREAT CACAPON	254220000
MORGAN COUNTY*		SW RT 9 4 MI S FISHER BLDG	LARGENT	254220000
MORGAN COUNTY*	BRIDGE ON W ST RR 9	1 MILE SOUTH OF FISHERS	BERKELEYSPGS	25411
MORGAN COUNTY*	GOLLIDAYS LOT 11	GOLLIDAYS LOT 11	LARGENT	254220000
MORGAN COUNTY*	W STATE RR 9	1 MILE S OF FISHERS BRIDGE ON	BERKELEY SPRING	25411
MORGAN COUNTY*	MORGAN WOODS S D LOT 12	MORGAN WOODS S D LOT 12	GREAT CACAPON	254220000
MORGAN COUNTY*		RIVERBEND SECTION LOT 28	BERKELEY SPRING	254110000
MORGAN COUNTY*	W S RR 9 AT FISHER BRG	W S RR 9 AT FISHER BRG	GREAT CACAPON	254220000
MORGAN COUNTY*		RUDOLPH ADDITION	LARGENT WV	254220000
MORGAN COUNTY*	LOTS 1 & 2 RUDOLPH ADDNS		PAW PAW	254340000
MORGAN COUNTY*		LT CACAPON RETREAT	GREAT CACAPON	254220000
MORGAN COUNTY*		573 RUNNING WATERS WAY	GREAT CACAPON	254220000
MORGAN COUNTY*		STAR RD 9	CACAPON	25411
MORGAN COUNTY*		SUMMER CP	LARGENT	267530000

Community Name	Address Line 1	Address Line 2	City	Zip Code
BATH, TOWN OF		19-23 S MAIN ST	Berkeley Springs	254110000
MORGAN COUNTY*	VIS LOT 36B	VIS LOT 36B	GREAT CACAPON	254220000
MORGAN COUNTY*		APPROX 7 MI S OF GREAT CACOPON	GREAT CACOPON	254220000
MORGAN COUNTY*		47 AC L85 F660 LOT 36	MAGNOLIA	26505
MORGAN COUNTY*		BRIARY BTM	GREAT CACAPON	254220000
MORGAN COUNTY*	CAPON RIVER VIS	LOT B-27	GREAT CACAPON	25422
MORGAN COUNTY*		CACAPON RIVER MDWS LOT 11	GREAT CACAPON	254220000
MORGAN COUNTY*	CACAPON RIVER ESTS LOT 11	CACAPON RIVER ESTS LOT 11	GREAT CACAPON	254220000
MORGAN COUNTY*	CACAPON RIVER MDWS LOT 12	CACAPON RIVER MDWS LOT 12	GREAT CACAPON	254220000
MORGAN COUNTY*	CACAPON RIVER RPDS LOT 23	CACAPON RIVER RPDS LOT 23	GREAT CACAPON	254220000
MORGAN COUNTY*		CACPN RIVER MDWS LOT 24	GREAT CACAPON	25422
MORGAN COUNTY*		CACAPON RIVER MDW LOT 25	GREAT CACAPON	254220000
MORGAN COUNTY*		CACAPON RIVER RPDS LOT 25	GREAT CACAPON	254220000
MORGAN COUNTY*		LOTS 5 & 6 CACAPON DIST	NEPTUNE BEACH	254220000
MORGAN COUNTY*	E S RT 9 2/5 MI S OF	CACAPON RETREAT LOTS 6/7 8	GREAT CACAPON	254220000
MORGAN COUNTY*	487 RUNNING WATER WAY	CACAPON RIVER RPDS LOT 27	GREAT CACAPON	254220000
MORGAN COUNTY*		1253 CONSTANT RD	GREAT CACAPON	254220000
MORGAN COUNTY*		DAVID BRIDGES N S OF RT 9 20	8 MI EAST OF P	254340000
MORGAN COUNTY*	CACAPON RIVER COLONY SUB	ROUTE 7 (ELEVATED BLDG NO ENCL	GREAT CACAPON	21144
MORGAN COUNTY*		6 W OF FISHER BRG	GREAT CACAPON	254220000
MORGAN COUNTY*		SW RT 9 4 MI S FISHER BLDG	LARGENT	254220000
MORGAN COUNTY*	BRIDGE ON W ST RR 9	1 MILE SOUTH OF FISHERS	BERKELEYSPGS	25411
MORGAN COUNTY*	GOLLIDAYS LOT 11	GOLLIDAYS LOT 11	LARGENT	254220000
MORGAN COUNTY*	W STATE RR 9	1 MILE S OF FISHERS BRIDGE ON	BERKELEY SPRING	25411
MORGAN COUNTY*	MORGAN WOODS S D LOT 12	MORGAN WOODS S D LOT 12	GREAT CACAPON	254220000
MORGAN COUNTY*		RIVERBEND SECTION LOT 28	BERKELEY SPRING	254110000
MORGAN COUNTY*	W S RR 9 AT FISHER BRG	W S RR 9 AT FISHER BRG	GREAT CACAPON	254220000
MORGAN COUNTY*		RUDOLPH ADDITION	LARGENT WV	254220000
MORGAN COUNTY*	LOTS 1 & 2 RUDOLPH ADDNS		PAW PAW	254340000
MORGAN COUNTY*		LT CACAPON RETREAT	GREAT CACAPON	254220000
MORGAN COUNTY*		573 RUNNING WATERS WAY	GREAT CACAPON	254220000
MORGAN COUNTY*		STAR RD 9	CACAPON	25411
MORGAN COUNTY*		SUMMER CP	LARGENT	267530000

Appendix N

Community Name	Address Line 1	Address Line 2	City	Zip Code
MORGAN COUNTY*	EBERHARDT'S ADDITIION TO	VILLAGE OF LARGENT LOTS 46 & 47	LARGENT CITY	254220000
MORGAN COUNTY*		107 N WASHINGTON ST	BERKELEY SPRING	254110000

CHAPTER 1 - LAND USE

Introduction

In order to determine how the County should grow and most benefit its citizens, it is important to first evaluate what factors have driven County growth to its current status. The Land Use Plan may then utilize these factors, including balancing the protection of natural and cultural resources with the extension of necessary public services to develop the most appropriate growth policies.

Although the County planning process does not currently provide for established zoning districts, mapping of existing land uses provides an outline of the natural progression of growth that has occurred. From these defined growth areas the Plan should provide direction on how best to manage and direct future growth patterns that will affect existing land use. This direction will then aid in the promotion of the designation of projected growth areas to serve an increasing population and economy, as well as define limitations that may affect the pace at which future growth occurs.

Existing Land Use

Residential land use comprises approximately 10,914 acres of the total area within Morgan County, with just over 6,500 acres estimated as developed. This is a significant increase from less than 4,700 acres in 1980. However, average lot size for this same period decreased from roughly one-acre per home in 1980 to just over 0.75 acres in 2000. This land use designation is made up primarily of three types of residential development. These areas include urban growth served by public water and sewer, newer suburban subdivisions, and the less defined rural pockets of residential dwellings. These types overlap other developed land use designations such as municipal as well as undeveloped land use designations such as woodlands and agricultural.

Commercial land use comprises 1,212 acres of the total area within the County, for those areas specifically outside of the incorporated towns and excluding industrial business parks. This is a new category from the 1985 Comprehensive Plan, and although it currently represents a small percent of the total County acreage is projected to increase throughout the County with the proliferation of new, larger residential development in areas where growth pressures did not previously exist. This land use designation is made up primarily of retail and service businesses that are located in and around residential development. Development of property for commercial use is also affected by the location of necessary public services as well as the adequacy of public infrastructure such as roads, water, and sewer.

Industrial land use comprises 3,014 acres of the total area within the County, most of which is owned by the US Silica Company. This area includes property that is part of undeveloped industrial property holdings, currently utilized for light and heavy industrial and manufacturing industries and underutilized developed land which may no longer serve its original purpose or be in full operation. Most of the land reflected in the 1985 Plan included more than 7,000 acres of

undeveloped property holdings under two companies, while the remainder was spread among nine smaller sites around the Berkeley Springs and Paw Paw areas. However, since that time the major landholders either sold off or changed their prospective use of the properties while most of the smaller sites have been developed or abandoned for industrial use and replaced with more appropriate locations. In order to designate and promote appropriate future industrial and manufacturing uses for these properties, it is important to understand the change in industries that provide the largest employment base for the local County workforce.

Agricultural land use comprises nearly 23,000 acres of the total area within the County. This is a decrease from more than 26,000 in 1980, and represents approximately 16% of the total County land area. Although the number of farms within the County has increased from 143 to 178, the average acreage per farm has decreased from 182 to 129 during this period. Further, the overall acreage being actively farmed has decreased from more than 13,000 acres in 1980 to less than 10,000 acres in 2005, with the remaining property primarily wooded.

Recreational land use comprises 11,562 acres of the total area within the County. The primary difference, or loss of recreational land over the 1985 Plan analysis is removing the 1,800 acre Coolfont Resort area that is privately owned, and therefore not available to be classified as public recreational area. Also, not included in this acreage is land designated as educational. However, it is reflected in Chapter 7 as part of the overall open space used by the public. Recreational land referred to in this chapter is owned and maintained primarily by the various governing entities for both active and passive use.

Educational land use, which totals 150 acres of the County land, comprises a small percentage of the total area within the County. This is primarily due to both a small and widely spread population that has not experienced a level of growth requiring construction of significant additional educational facilities and their accompanying school athletic field needs. However, given recent growth trends, including pace and location of new development, coupled with the fact that many existing schools are located on property with limited room for expansion and provision of adequate field space, it will be important for the school system to use the projections within the Comprehensive Plan to prepare to address future school needs. This is evident in the fact that over the last decade several older schools on smaller properties have been replaced by newer schools on larger campus settings, two of which make up two-thirds of the total acreage.

Municipal land use comprises 704 acres of the total land within the County. This land exists within the two incorporated towns including nearly 400 acres in the Town of Bath and the remainder in the Town of Paw Paw. The increase in acreage from 1980 to 2005 is due to differences in classification, whereas the 1985 Plan classified some areas in the County as “urban built-up area”, and the classification for this Plan refers to specifically those areas within the municipal limits. In reality there have been less than 50 acres of land annexed during that period. Due to the varying mixture of uses, and the continual evolution of these primarily built-up areas, it is difficult to classify any large single area within either Town under one particular land use designation. Therefore it is understood for purposes of this chapter that areas within each town contribute in some part to all of the land uses listed.

Public land use is defined in this chapter as land other than schools and parks owned by government for the provision of public utilities and services such as water and sewer, police, fire, libraries, and transportation. These uses comprise a small amount of the overall County acreage and are included in various designations as outlined in this chapter. More important, as reflected in Chapters 3, 4 and 5 of this Plan, is the current location of these services as it relates to their need and ability to physically expand in order to adequately address future growth.

Woodlands comprise 117,000 acres of the total area within the County. This land use makes up a large part of the County, covering vast areas across many types of land uses including more than 11,000 acres in recreational, 12,000 in agricultural and some smaller amounts in other classifications. The net acreage thus represents roughly 80% of the total County land area. This acreage has remained relatively constant over time due in large part to some areas previously in active agricultural production giving way to passive woodland, while in other areas previously wooded, new development has occurred. Although it is estimated that clear cutting for development accounts for only 130 acres of the total 1,130 acres cleared per year, consideration of preservation of these natural areas may be required in future planning process.

Historic and conservation land uses act more as an overlay of those areas previously outlined. The historic areas may include both natural and built features within the County that should be identified to protect their individual importance to the character of the community in which they are located. Conservation areas include both public and private properties. These areas may be protected through more stringent regulations that preserve the environmental integrity and sensitive elements that extensive growth would impair.

In addition to the various land use categories is the acreage for roads and water. Water coverage makes up less than 1% of the County's total landmass, which equates to just over 1,000 acres. This has remained relatively constant over time as development and environmental changes have not had significant effects on changing the County's waterways.

As residential development has nearly doubled since the 1985 Plan, local road systems have been added to serve new homes and accompanying commercial centers. Added to the nearly 400 lane miles of roads maintained by the West Virginia Department of Transportation, highway and road systems are estimated to cover approximately 3,000 acres of the total County land area.

Based on US Census data the total County land mass consists of 229.67 square miles. Converted to acres, the total County land mass is 146,988.8 acres. Subtracting out the total estimated acreage covered by water and roads, the total net land use acreage is approximately 142,970 acres.

In developing Table 1-1, all acreage for those types of land uses clearly documented were established first. From this calculation acreage for those land uses not documented, specifically residential and commercial, were estimated from the remainder.

Based on review of the 2006 County tax year statistics it was estimated that 10% of the remaining acreage could be classified as commercial and 90% residential with 80% and 61% developed respectively. Several notable changes from the 1985 Plan include:

- Reduction in total estimated County acreage from 149,277 to 146,989
- Increase in total residential acreage from more than doubling of housing stock
- Accounting for undeveloped acreage in the residential planning pipeline
- Reduction in total industrial acreage due to changes in designation of land holdings
- Reduction in recreational land due to removal of large private recreational property
- Increase in municipal acreage from 1985 which listed an "urban" acreage of 416

Table 1-1 Land Use (acres)

Land use	1980	1980 Net	2000	2000 Net	Change in Acreage
Residential	4,864	4,864	10,914	6,658	6,050
Commercial	N/A	N/A	1,212	971	N/A
Industrial	8,162	511	3,014	678	-5,148
Agricultural	26,068	13,635	22,953	9,475	-3,115
Woodlands	121,650	129,301	117,000	123,834	-4,650
Recreational	13,315	500	11,562	500	-1,753
Educational	50	50	150	150	100
Municipal	416	416	704	704	288
Total		**149,277**		**142,970**	

Source: Morgan County Government, USDA Census of Agriculture

Land Use Zoning Regulations

Under West Virginia State Code, Article 8A-7-1 provides counties the ability to enact zoning ordinances. Based on this provision, there have been considerations in the past of enactment, the most recent of which included the development of a tentative report and explanatory map which outlined comprehensive zoning ordinances and land use designations. This report was considered for adoption by the County in 1994 and ultimately turned down. The State Code specifically outlines the process by which a County must proceed with enactment including:

- Determining the area in which the ordinance will apply
- Consideration of the contents of the ordinance and its application
- Certification of zoning district boundaries and maps
- Completing a study and providing a report of existing and proposed land uses
- Providing public review and input through hearings prior to enactment

Although the land use map in this chapter does not serve as part of any process to establish zoning, it does provide the basic outline of many of the existing land use categories that could be used in development of zoning designations. This map merely provides all property within the County with a land use designation that reflects the current or proposed use of that property in

relation to the larger whole of the surrounding area. Therefore in certain instances it may not reflect the use of each property specifically, but rather should be used as a guide for uses in general within the defined area.

Although the County has not chosen to enact zoning through its process of consideration, the Town of Paw Paw does have zoning ordinances which apply to those area located within the corporate limits of the Town, and to all properties that would be annexed.

Population Trends

For purposes of development analysis and growth projections, this chapter is divided into 3 planning areas made up of 6 districts. These areas include: the small northeastern tip of the County known as the Sleepy Creek region, the Central Valley region, made up of four districts that encompass the largest and most heavily populated area, and the southwestern mountain area known as the Cacapon region, which includes the Town of Paw Paw as well as a large amount of publicly owned lands. These planning regions are further referenced throughout the Comprehensive Plan.

Morgan County is the western most of three counties that make up the Eastern Panhandle of West Virginia. These counties, unlike much of the rest of the State have experienced significant increases in growth over the past 50 years, due in large part to the automobile-driven development pressures from the growing metropolitan areas of Baltimore and Washington to the east. It has also experienced recent pressures from the spreading Winchester area in Virginia, to the south.

Historic growth shows that the County experienced a 25% increase in residential growth between 1970 and 1980. Prior to this time growth was either negligible or in some areas declining. This increase in growth, however, did not result in a significant increase in population since the average household size continued to decline from 3.1 persons per household in 1970 to 2.8 in 1980. Further, an increasing percentage of this residential growth was due to new construction of scattered minor rural subdivisions and single lot recreational homes. By 1980 the decrease in average household size and increase in rural lot development produced roughly an average population of 46 persons in 16 households per square mile.

Between 1980 and 1990 the growth trend slightly declined, producing roughly 57 additional households or 143 persons each year as compared with nearly 74 new households and 215 persons per year in the previous decade. This decline included as well further decline in household size to just over 2.5 persons on average. Growth patterns during this period were focused on new development being located in the Sleepy Creek and upper Central Valley regions.

In spite of the further decline of household size to 2.43 persons per household, the growth trend of the previous decade nearly doubled between 1990 and 2000, adding more than 117 new households and 280 persons per year, which accounted for an increase in population from just over 12,000 in 1990 to nearly 15,000 in 2000. One important trend bolstering new households

during this period, which is further outlined in the Population and Housing Chapter, is the reduction of vacant rental units from nearly 13% to 7.6% in this period. As a result of the significant increase in growth from 1980 to 2000 the average population and households increased to roughly 65 persons in 27 households per square mile, which accounted for nearly a 71% population and 60% housing increase over the 1980 figure.

Table 1-2 Population Trends

Trend	1960-1970	1970-1980	1980-1990	1990-2000
Household Size	3.1	2.8	2.5	2.43
Units per Year	7	74	57	117
Annual Population Increase	20	215	143	280
Housing per Square Mile	14	20	23	30
Persons per Square Mile	37	46	52	65

Source: US Census Reports

The most significant increase in growth has occurred over the past 5 year period between 2001 and 2005. In 2002 Morgan County experienced its first year of issuing more than 100 permits for new homes. In 2005 this number approached 300. It appears from submission of major residential subdivision development plans and continued increases in the annual number of minor exemption approvals, that permit activity will not decrease significantly in the near future.

At the current pace it is projected that the 2010 population could reach 20,318 under the medium growth scenario, which would mean an increase of more than 1,110 new housing units equating in an average yearly population increase of 566. While still remaining quite rural in its overall appearance, this growth will result in increased population and housing densities, especially in the more densely developed urban areas within the County.

Table 1-3 Historic Population

Location	1970	1980	1990	2000	2005
Sleepy Creek	640	967	N/A	N/A	N/A
Central Valley	6,063	7,673	N/A	N/A	N/A
Cacapon	1,844	2,071	N/A	N/A	N/A
Town of Bath	944	789	735	663	764
Town of Paw Paw	706	644	538	524	N/A
Morgan County	8,547	10,771	12,128	14,943	17,232

Source: Morgan County Comprehensive Plan 1985, US Census Reports

Building Intensity

From the growth trends described above, the County has experienced three distinct types of residential development. These include lots with well and septic, private community systems for water and sewer, and public-utility-driven growth. Each type of development has a different impact on the ability to adequately provide various public services, which must be taken into account in providing direction for future growth. This is important in development of a land use map because the provision of water and sewer services in particular plays a large role in determining the density and pace at which development may occur.

From existing activity it is estimated that there is a total of 1,117 lots currently in the development pipeline for major subdivisions. In order to be included in this pipeline, it means that the proposed development has a reasonable probability of fruition in the Plan period due to the fact that plans have been granted some stage of review.

Major Subdivision Activity

As outlined in Table 1-4, there are several changes taking place in the development pipeline, which must be considered to understand better how increased pressures may affect growth. In using the sketch plan to final plat as a timeline, one noticeable trend is the increase in total number of lots being submitted for development approval as part of a single subdivision. These larger developments also include an increased average density per acre, which means that under State regulations many of these larger, denser developments must be supported by a public or community water and/or sewer system. It should also be noted that many of the smaller developments that have reached final plat approval, and therefore presumably older in the pipeline, have been submitted in sections, which typically denotes that the development is part of a larger whole being constructed by a smaller developer over a longer period of time.

Table 1-4 Major Subdivision Activity

Subdivision	Approval	Location	Units	Acres	Avg. Lot Size	Year Start
Various Plans	Sketch Plan	Central Valley	894	411	.46 acre	N/A
Huntington Farms	Preliminary	Timber Ridge	56	90	1.6 acres	2006
Parkside Section II	Preliminary	Rock Gap	11	28	2.5 acres	2006
Pious Spr. Sect. I&II	Preliminary	Allen	9	23	2.6 acres	2006
Point View Estates	Preliminary	Rock Gap	15	24	1.6 acres	2006
Cacapon S. Sect. V	Final Plat	Timber Ridge	31	50	1.6 acres	2006
Fairview Oaks Sect. I	Final Plat	Bath	15	22	1.5 acres	2006
Horseshoe Run	Final Plat	Allen	43	125	2.9 acres	2005
Orleans Overlook	Final Plat	Cacapon	5	15	3 acres	2005
Parkside Section I	Final Plat	Rock Gap	14	16	1.1 acres	2005
Pious Spring Sect. I	Final Plat	Allen	5	17	3.4 acres	2004
Silo Acres	Final Plat	Allen	12	26	2.2 acres	2004
Stonewood	Final Plat	Allen	7	18	2.6 acres	2004
Totals			**1,117**	**865**	**0.77 acres**	

Source: Morgan County Government

Minor Subdivision Activity

Although major subdivision activity is increasing, it appears that much of the current and past development continues to occur on individual building lots within subdivisions of less than five total lots, which are commonly referred to as exemptions that often include several lots and a remainder. In order to better understand trends as it relates to this type of growth and the effect it will have on future development patterns in the County, it is important to utilize recent data due to the fact that unlike large subdivisions which may be affected by government policy, environmental constraints, or significant changes in land value, minor lot exemptions are not typically limited by such constraints, but collectively impact services, infrastructure, and available resources in a similar manner.

Table 1-5 Minor Lot Exemptions (Individual buildings lots of less than five total lots)

District	2000	2001	2002	2003	2004	2005	Total	Annual Average
Sleepy Creek	1	0	16	5	0	18	40	7
Allen	24	18	10	33	6	41	132	22
Bath	5	2	12	13	16	13	61	10
Rock Gap	16	20	23	33	21	32	145	24
Timber Ridge	34	45	15	16	34	13	157	26
Central Valley Total	79	85	60	95	77	99	495	82
Cacapon	10	13	5	16	34	29	107	18
Total	**90**	**98**	**81**	**116**	**111**	**146**	**642**	**107**

Source: Morgan County Government

Development Activity

It is apparent from the tables above that the concentration of newly approved growth is and will continue to occur in the southern area of the Central Valley Planning Region, especially in the Timber Ridge and Rock Gap districts. This region includes 1,112 of the total proposed 1,117 major subdivision lots, and has experienced an average of 82 minor lot exemptions per year since 2000. This region also includes an estimated 1,750 undeveloped residential parcels which may yield a significant amount of additional future growth. This does not include the nearly 200 farms, most of which are located in the south central area of this region and can be expected over time to continue to experience both marginal and major development patterns. For this reason it may be important for the County to identify these areas and establish programs to maintain the agricultural character of important areas within this part of the Central Valley region.

The second most impacted region for immediate future growth is in the Cacapon Planning Region. Located west of Timber Ridge. There is only one listed major subdivision containing 5 lots in the development pipeline, and approximately 18 minor lots per year on average over the past 6 years. However, the number of minor lot exemptions approved has continued to grow

from 10 in 2000 to 29 in 2005. Further, this region includes many of the necessary resources that may adequately absorb future growth, with an estimated 1,615 undeveloped residential parcels. Given this amount of vacant available acreage, this region could also experience significant additional residential dwellings. However, unlike the Central Valley Planning Region, this area has a much smaller number of parcels classified as farms and due to its more rural character limited community and public water and sewer systems may expect to see a greater number of minor lot exemptions on larger lots over a longer period of time.

Although it appears that the much smaller Sleepy Creek Planning Region is least impacted at this time with no major subdivision proposals in the development pipeline and a sporadic annual average of 7 minor lot exemptions, pressures from the spreading growth in Berkeley and Jefferson counties immediately to the east, and the lack of adequate infrastructure and resources elsewhere in the County may change this direction at any point. However, this region being much more limited in physical size has less than 600 undeveloped residential parcels remaining for additional growth. Under optimistic standards this may yield a limited amount of additional growth. Further, it has less than 20 farms, and appears from recent permit activity to be building out at a faster pace than the Cacapon Planning Region, which would determine that both land and resources may be "used up" sooner than either of the two larger planning regions to the west.

Population Projections

Population projections for the County are developed in order to ensure that public utilities and services are adequate to provide for the natural increase in development. Projections are affected by such factors as the economy, household size, public policy, and adequacy of services. They are developed based on historic growth trends, current development activity, and land available for future development. However, given the method in which each factor may be affected, it is important to develop at least three growth scenarios for the County to consider when planning for the financing and provision of services.

Low Growth Scenario

The low growth scenario takes into account the pace at which development has occurred over the past 20 years. Although much of this chapter has focused on presentation of information in census periods, the impact of growth since the 2000 census period has increased significantly, and must be accounted for. Therefore, for purposes of this scenario the historical growth period will be measured from 1985 to 2005. During the past 20 year period as outlined, the average annual increase was 306 persons or 120 additional units with an average household size of 2.55 persons per household. Using these historical figures to project growth for the next 20 years, this static scenario would result in a projected population of 23,352 in a total of 9,487 dwellings for the year 2025. This assumes there will be similar periodic constraints on new development that have occurred in the past, and a significant decline in recent growth trends.

Medium Growth Scenario

The medium growth scenario analyzes all land currently available for development and the projected ability for existing public services to adequately provide for that growth. It is much more difficult to project than the low and high scenarios, as it must take into account potential changes in infrastructure, economy, services, and especially the regulatory process. This scenario recognizes that the current development pipeline will exceed the low growth scenario, while at the same time acknowledges services and resources may need to be expanded or improved in a more timely manner in order to sustain the pace estimated under the high growth scenario.

Taking into account that although a significant amount of development has been placed in the development pipeline, the actual build out of such development between 2000 and 2005 has averaged approximately 222 new homes being constructed and occupied per year. In comparing this data with the estimated availability of services from other chapters, it is evident that the pace of both current and projected growth will be affected by improvements to these necessary services being an integral part of the overall development process and the finite capacity of natural resources. This includes such examples as:

Public Service Needs

- Schools- the overall school system having less than 600 available seats will need to be evaluated for efficient student distribution and timing of expansion to handle increased growth
- Roads- upgrades will be required to address major issues such as capacity limitations on US Rt. 522 and alignment deficiencies on WV Rt. 9 as well as minor local road needs
- Public Safety- entities experiencing increased call load on primarily volunteer services will need additional funding for personnel and capital equipment outlay

Environmental and Natural Resource Limitations

- Water- development will be affected by future regulatory measures, the cost of extension of service, and the accuracy at which quantity may be accounted for and distributed
- Sewer- development will be affected by additional regulatory restrictions, the cost of extension of service, and the term of existing consent orders placed on various systems
- Sensitive Areas- consideration of development in areas where there are sensitive soils, sleep slopes, waterways, floodplains and other significant features

Other Factors Affecting Development

- Market- market demand for housing has experienced a significant jump in housing prices, while there has been a noticeable decrease in average number of new units available
- Government Regulation- potential creation of comprehensive local zoning ordinances and expanded State and Federal environmental regulations

It is assumed that in order to maintain the recent pace of growth, such necessary services and regulations would be addressed as part of the development process. In addressing these current and projected limitations, it is also assumed that the 2005 peak of more than 300 permits will steadily decline and eventually level out as public will places increased pressure on the regulatory process to require growth and services be consistent in their collective approach.

Given this experience as reflected in the growth process of more developed counties to the east, it is a fair estimate to conclude that Morgan County may expect to experience a more balanced pace of an additional 566 people in 222 units per year through 2025. However, although Table 1-6 may reflect these increases in 5-year periods, it should be understood that the ebb and flow of such increases may depend largely on the ability for services and resources to adequately provide for the additional growth as well as market and regulatory effects. If this pace is achieved during the Plan period and average household size climbs slightly up to 2.55 from its current 2.4, it would result in a 2025 population of 29,577 in a total 11,599 dwelling units.

High Growth Scenario

Like the low growth scenario, the high growth scenario will also utilize an average household size of 2.55 persons per household, but will continue the recent escalation in development activity rather than an average of the previous 20 years. The high growth scenario takes into account all land currently available for development, as well as optimal conditions that reflect continued growth pressures that have been experienced in the past several years. Therefore, for purposes of this scenario it is assumed that growth will continue to build out without limitations to infrastructure, services, economy, or changes in the regulatory process. Under this scenario the County would continue to approve 223 new residential units per year for major subdivisions, and that the number of approved exemptions will continue to increase by 4 additional permits per year. This would result in a projected population of 37,890 in a total of 14,859 dwellings for the year 2025. This assumes that there will be a steady housing vacancy rate, an additional 3,140 minor lot exemptions and 4,460 major subdivision units, adding approximately 380 units per year and more than doubling the population and housing within the County.

Table 1-6 Population Growth Scenarios

Scenario	2005	2010	2015	2020	2025
Low Growth	17,232	18,762	20,292	21,822	23,352
Medium Growth	17,232	20,318	23,404	26,490	29,577
High Growth	17,232	22,397	27,562	32,727	37,890

Factors Affecting Growth

Public Services include all necessary and desirable services provided by the government that allow for a community to function appropriately. These services range from necessary services such as public safety to desirable amenities such as public libraries. It is important to link the goals of the public services section of this Plan with the potential changes in land use and ultimately the direction of growth in order to ensure that services are timely, adequate, development funded, and above all financially efficient to maintain.

Infrastructure includes both public and privately developed services that are necessary in order for development to occur. These services primarily include roads, water, and sewer. It is important to understand how the extension of infrastructure, or lack thereof, over time has

allowed for growth to occur. This will allow for the public to make the most appropriate decision on whether growth will be better served by well and septic, private systems or public water and sewer, and determine how to best manage the design and maintenance of road systems to ensure efficient transportation networks and traffic flow.

Because environmental regulations are driven by ever changing State and Federal policy, this constraint is often the most overlooked and unpredictable factor affecting growth. In order to sustain some consistent direction for the County as it relates to growth and development, it is important for the County to develop policies that place it at the forefront of environmental policy rather than at the mercy of development that may leave behind costly measures for the County to later correct. This includes such efforts as assessment of the existing water table, watershed capacity and other information involving the establishment and extension of water and sewerage resources.

Possibly the most important factor affecting land use and growth is the socio-economic make up of the County. This can be observed at every point across the County from substandard housing to large vacation homes as well as declining industry and the rise of small seasonal retail tourism. In order to direct such change in a comprehensive manner, it is important to develop a plan for the most beneficial use of finite public resources. To accomplish this effort, the County must develop and lead this direction through the necessary implementation of all available planning tools that serve to guide all growth in an appropriate and timely manner.

Land Use Planning Tools

Although there are currently no zoning regulations governing land use within Morgan County, there are numerous available planning tools that should be considered by the County during the plan period to guide future land use. Given the sensitive issues surrounding what land use policies can and cannot control, it is important that the public is invited to participate in this decision making process. The following land use tools may be important to consider in the effective growth management of the Comprehensive Plan.

- Countywide Zoning Ordinance as provided by State Code and based on the strategies outlined in the Comprehensive Plan, most notably the ability for resources to support various types of growth in designated areas.

- Subdivision and Land Development Regulations recently updated by Morgan County to ensure that techniques used for development of land will be consistent with measures to benefit the entire County

- Traditional Neighborhood Design development with concepts that recreate and promote the continuation of small town character in design elements of new subdivisions and redevelopment proposals.

- Planned Residential Development permits innovative, well planned development that creates open space, blends housing types, and includes a mixture of uses that promotes neighborhood activity.

- Overlay Districts may be considered as part of the development of a comprehensive zoning ordinance to allow for increased flexibility within classifications while preserving the underlying controls that ensure neighboring uses are compatible.

- Agricultural Land Preservation includes methods to establish permanent easements that protect prime agricultural land from development, while providing financial value to the farmer to continuing viable operations.

- Transfer of Development Rights preserves land for agricultural and other sensitive areas directing growth to preferred development areas where services and resources are available.

- Neighborhood Revitalization incentives work to identify blight areas and properties that detract from the overall health of a community so that targeted strategies can be established to address each area's need.

Goals & Objectives

Goals

The goal of land use planning in Morgan County is to provide a reasonable, flexible guide for an orderly and economically sound pattern of development consistent with the goals in this Comprehensive Plan, which include:

- Preserving the rural nature of the county while providing for compatible residential, commercial and industrial development;
- Protecting, encouraging and maintaining viable agricultural land use;
- Preserving the views, water resources, and other natural features that define the county; and
- Protecting and enhancing the cultural, historic and aesthetic aspects of life in Morgan County.

Objectives

These goals may be achieved by implementing objectives such as the following:

Procedural Objectives:

- Establish some measure of countywide comprehensive land use controls;
- As one aspect of establishing land use controls, evaluate the need for zoning regulations and associated enforcement mechanisms;

- Determine the issues and how the process for obtaining Planning Commission review and approval for development plans might be streamlined;
- Promote coordination of the work of government entities to identify and designate areas where public services, infrastructure expansion, and public utilities will be needed in the future; and
- Create clear, consistent definitions for land use designations and development standards.

Land Use Design:

- Consider incorporating into development regulations elements that would protect view sheds and other natural features;
- Expand programs that protect the viability of active agricultural land uses;
- Ensure that adjoining areas are compatible when mapping transitions from urban to rural areas; and
- Create policies that provide adequate buffers between conflicting land uses, and limit incompatible land uses around farmland, historic sites, and industrial extraction areas.

CHAPTER 6 – SENSITIVE AREAS

Introduction

The rural areas chapter identifies those sensitive natural environmental features, which merit protection from development. These physical features are delineated based on steep slopes, floodplains, wetlands, sensitive soils, forests, rivers, prime agricultural lands, or mineral resources. It is obvious that the intensity of the use of the land is often dictated by the physical attributes of the property. As sensitive areas do not typically follow property lines, these attributes affect numerous adjoining properties, thus creating natural land use patterns. Protection of these attributes may be achieved through incorporation of these features into future development proposals.

Morgan County, by comparison to its adjacent counterparts, has some extensive physical constraints to land use. However, some of these constraints have been overcome or neglected in order to allow development to occur in locations where a more limited approach might be suggested by a site's natural features. This limited approach should require careful development design in order to protect sensitive features and correct existing negative encroachments or prohibitions on development. In order to provide the public with a justifiable understanding of this approach, the ecological and environmental benefits and the potential degradations should be clearly identified and defined. This may ultimately influence what land use types are appropriate for each development proposal.

Steep Slopes

Possibly the most notable and impacting physical feature to future growth and development within Morgan County is the amount of land delineated with steep slopes. Nearly 47% of the County may be classified as having slopes greater than 25%, which is the maximum slope for installation of individual septic systems, and thus the generally accepted limit for structural improvements to property. Another 21% falls within the 15% to 25% range, and nearly 30% is between 8% and 15%. Less than 5% of the County may be classified as relatively flat, containing a slope of less than 8%.

The region most affected by this topographic feature is split between the Cacapon and Central Valley planning regions, along the east and west Cacapon Mountain ridges. The benefit in the Cacapon Planning region exists in the large amount of relatively flat land through its northwest corridor, while the Central Valley Planning region benefits from major water, sewer, transportation and other available services.

While two-thirds of the State land is sloped more than 25%, Morgan County is just under one half, yet more severe than its two eastern panhandle neighbors to the east. The County is located in the physiographic region known as the Ridge and Valley Province. For purposes of describing the topographic conditions, the County may be divided into two types of areas; Mountain Area and Ridge Area.

Mountain Area

The Mountain Area from the west is a series of northeast-southwest rugged mountains separated by narrow valleys. The mountain slopes are gashed by steep runs giving a very rough topography, which continues on to the west.

At the western edge of the Mountain Area is the narrow Potomac Valley, which follows a northeast course parallel to the trend of ridges, but in a meandering channel. This valley is bounded on the Morgan County side by Spring Gap Mountain, Purslane Mountain, and Sideling Hill, which have steep and highly dissected slopes down to the river. The fall from the top of these mountains to the river is 1,220 to 1,400 feet in a distance of one to one and a half miles. In the valley are numerous flat-topped hills rising 800 to 1,000 feet above the valley floor.

Spring Gap Mountain extends from Hampshire County into Morgan County for a distance of three-fourths mile, southeast of Paw Paw. It is a level-topped mountain of 1,800 feet elevation with steep slopes.

Purslane Mountain and Sideling Hill are separated by a high level valley drained by Rockwell Run. Purslane Mountain on the west side of the valley has a level top, 1,700 to 1,800 feet in altitude. The highest point on Sideling Hill is 2,029 feet above sea level located about three miles north of the Hampshire County line. Its west slope is deeply trenched by short steep runs forming very rugged slopes, while on the east; slope erosion has not been as prevalent. The valley on the east side of Sideling Hill is 200 to 300 feet higher than the Potomac on the west. The mountain is cut by a deep gap at the north where the Potomac cuts through.

The valley east of Sideling Hill is separated into two parts by a low transverse divide 800 to 900 above sea level. From this divide, the land slopes generally south to east to the Cacapon River, and north for a distance of five miles to the Potomac River. This valley contains two northeast-southwest ridges, known as Bare and Road Ridges; whose level tops are about 800 feet above sea level.

The east side of the valley is bounded by Tonoloway Ridge, reaching a height of 1,000 to 1,100 feet. Its eastern slopes are almost perpendicular walls to the Cacapon River. It is cut by a wide gap at the south where the river passes through and by a gap three-fourths mile wide at the north where the Potomac cuts through.

The western limit of the Mountain Area of Morgan County is Cacapon Mountain, which is the highest mountain in the area. It begins southwest of Sir Johns Run, on the Potomac, as a ridge 600 feet high and rises over a distance of four miles to 1,545 feet at Prospect Rock. The mountain reaches its highest point in the northern area, at 2,196 feet, five miles southwest of Prospect Rock. It is 2,320 feet high at the Morgan County boundary with Hampshire County.

Ridge Area

The Ridge Area of Morgan County begins at the Cacapon Mountain and extends east across a broad valley broken by parallel low ridges which follow the same course as the mountain. This area exhibits long narrow valleys and ridges as does the area west of Cacapon Mountain; but is dissimilar in that Sleepy Creek cuts across the ridges creating a drainage area of transverse as well as longitudinal valleys. The result of these changes is a very different type of topography than that west of the Mountain.

Warm Spring Ridge extends from the south line of the County north to the Potomac River and beyond into Maryland. The ridge is level topped at 800 to 900 feet at the north and 1,200 at the south. Its slopes are steeper on the east than on the west. The valley between this ridge and Cacapon Mountain is drained to the north by Sir Johns Run and to the south and east to Sleepy Creek Run by Rock Gap Creek. At the south, this valley is drained by Indian Run, which flows north and east to Sleepy Creek.

The eastern slope of Warm Spring Ridge is drained by the north flowing Warm Spring Run. The valley of this run at the north is bounded on the east by Horse Ridge, which is a long level ridge of 800 feet elevation. Further south, this ridge is continued in the form of isolated hills of 900 feet elevation, but natural erosion has destroyed the ridge as a continuous line in the topography.

East of Horse Ridge at the north is the valley of Dry Run, then Pious Ridge, 600 to 800 feet in elevation. The broken continuation of this ridge is Timber Ridge at 900 feet through which Sleepy Creek cuts a gap.

Sleep Creek Mountain ranges in height from 1000 feet at the north to 1700 feet and ranges from a height of 1800 feet toward the south end of Morgan County. The slopes of this mountain are steep and rugged, but are not cut by run valleys as are the mountains to the west.

Water

Morgan County is located entirely within the Potomac River Basin. All of Morgan County drains north to the Potomac except a small area in the southeast corner. The importance of the County's water resource must be emphasized and evaluated as it continues to become more limited in availability over time, due to varying factors such as increased usage and other measurable impacts.

Rivers and Streams

The Potomac River forms the boundary line between Maryland and West Virginia along the northern line of Morgan County. The River is actually part of the State of Maryland and is under jurisdiction of the Maryland Department of Natural Resources for water quality and river use. From the southwestern corner of Morgan County, the river follows a strongly meandering course northeast 28 miles to the cut through Sideling Hill. The bends are very symmetrical and deeply trenched in the valley. The fall of the river in this section is low, averaging 2.5 feet per mile.

From Sideling Hill, the river flows east to Cacapon Mountain for 5 miles of straight channel with a fall of only 1.7 feet per mile. It then turns northeast to Hancock, curving in a small meander around the ridge near Roundtop on the Maryland side. This meander is nearly a half-mile wider than its former channel. From Hancock, the river flows southeast in a nearly straight channel for 10 miles to the mouth of Cherry Run. The fall of the river from Sir Johns to this point is 1.3 feet per mile.

Along the western end of Morgan County, the streams are small runs which rise on Purslane Mountain and reach the Potomac by short courses. Rockwell Run is the largest of these and follows the high level valley between Sideling Hill and Purslane Mountain, at an elevation of 1,200 to 1,600 feet above sea level, to a transverse gap at the north end of Purslane Mountain, where it turns west toward the Potomac. Its total length is about 5 miles with a fall of 1,140 feet, or nearly 230 feet per mile. Like all of these mountain runs, Rockwell Run averages a relatively small volume of water fed by springs, but in a period of rain becomes a roaring torrent, which can cause rapid erosion.

The Cacapon River is the fourth largest tributary to the Potomac River. Its source is in the highlands of Hardy County, Virginia and it follows a northeasterly course across the eastern portion of Hampshire County through the western part of Morgan County to the Potomac River at Great Cacapon. The total length of its channel is 100 miles and the average fall is 11.8 feet per mile. Its upper reaches have a steep gradient with some falls and rapids, while the lower third is more sluggish and meandering. Within Morgan County, the Cacapon features a gentle gradient and numerous long pools as it transcribes huge, slow-flowing loops through the mountains. The land cover is primarily forested slopes and flood plain terraces. The Morgan County segment is the most developed and platted stretch of the river, with individual residences, vacation cottages, and large subdivision developments dotting the banks.

Sleepy Creek has its source on the west slope of Timber Ridge in the northeastern part of Hampshire County and follows this ridge northeast to Rock Gap, where it crosses the ridge in the southern part of Morgan County. The length of its channel is 42 miles and the average fall is 17 feet per mile. Its drainage basin is broad, extending from Sleepy Creek Mountain to Pious Ridge on the west for a width of 4 to 5 miles and covering nearly 93,000 acres. Its tributary creeks and runs on the west cut through transverse valleys in the ridges to join the main stream, as in the case of Rock Gap, which has cut a deep gorge through Warm Spring Ridge. This watershed is nearly 50% forested with another third in active agriculture use. On the east side of the main creek, the large tributaries such as Mountain and Meadow Runs follow the rock structure.

Sir Johns Run drains the valley between Cacapon Mountain and Warm Spring Ridge. It follows a course parallel to these ridges for 8 miles at a fall of nearly 70 feet per mile. The valley is narrow, its branches short, and the volume of water is small except after rains.

Warm Spring Run drains the valley between Warm Spring Ridge and Horse Ridge. Its length of nearly 11 miles falls at a rate of nearly 40 feet per mile. It follows close to Warm Spring Ridge and is fed by various springs, especially by the warm springs at Berkeley Springs. On the east it has a number of short tributaries, which extend into the divides separating them from the Sleepy Creek drainage area.

Surface Water Quality

As established above, Morgan County has numerous surface water bodies that traverse various parts of the County. Based on the collection of data over time, most of these surface water sources are in healthy condition. Water quality parameters that are evaluated include dissolved oxygen, pH (acid-alkaline balance) temperature, metals, and conductivity. There have been occasional violations of State criterion for fecal coliform bacteria, which is indicative of either human or animal waste entering the stream from houses, septic systems, or agricultural activities.

Specifically, in reference to the Cacapon River, water quality is considered excellent as evidenced by data collected by West Virginia Department of Environmental Protection. Like many of the streams in the Eastern Panhandle that are unaffected by mine drainage, the Cacapon has an excellent pH value. The average acidity, alkalinity, and hardness values are also indicative of high water quality. Oxygen problems are virtually unknown. Only one instance has been recorded in which the fecal coliform standard was violated; and other than minor infractions of copper, iron, lead, silver, and cyanide levels, the parameters have never exceeded the acceptable limits for all other metals for which the State has standards. The Cacapon remains one of the State's highest quality streams.

The potential exists in Morgan County for water quality problems due to sediment loadings which occur after heavy rains in areas of agricultural and increased construction activities. Sediment often includes organic and inorganic pollutants from fertilizers, pesticides, animal wastes, and construction materials. Chemical pollutants may be toxic to fish and may be retained in fish, which have eaten contaminated organisms. Over a period of time, sediment fills watercourses, covering bottom dwelling organisms and contributing to increased flooding potential. By increasing turbidity, or cloudiness of the water, sediment reduces light available for growth of aquatic plants and animals. For all these reasons, sediment offers the potential to significantly reduce the scenic and recreational value of Morgan County.

West Virginia's water quality standards include a criterion for turbidity. This turbidity limitation applies to all earth disturbance activities by measuring stream quality directly above and below the area where drainage enters the affected stream.

Floodplains

Floodplain areas perform a number of critical ecological functions. They absorb, store, and release large amounts of water to surrounding soils and groundwater systems. Natural vegetation supported by floodplains helps to trap sediment and absorb excess nutrients from upland surface runoff, stabilize stream banks, and reduce soil erosion. Floodplains also provide habitat for terrestrial wildlife and influence stream conditions for aquatic life. Beyond their ecological value, many people value the scenic qualities of floodplain areas, particularly for their wildlife and waters.

In 2005, the West Virginia Flood Protection Task Force presented the first West Virginia Statewide Flood Protection Plan. The multi-agency task force was led by the WV Conservation

Agency and the U.S. Army Corps of Engineers. The Plan was developed over a period of three years and spells out both long and short-term goals, strategies and implementation schedules. The six specific goals the plan addresses are:

- Reduce the unnecessary loss of lives due to flooding
- Reduce private and public property damages due to flooding
- Develop technical and administrative tools to manage flood loss reduction and floodplain management
- Promote technical and legislative tools that will reduce excessive runoff from land conversion activities
- Reduce personal and economic loss due to flooding while supporting state economic growth
- Protect the state's waterways and floodplain environments

These goals focus around 12 key issues:

- Floodplain management
- Flood Warning System
- Floodplain Mapping
- Flood Damage Assessment
- Impacts of Flooding
- Building Codes, Permitting and Enforcement
- Stream Crossings and Access Roads
- Dredging
- Resource Extraction
- Stormwater Management
- Education
- Existing Flood-prone Structures and Facilities

All floodplains in Morgan County are subject to floodplain regulations as delineated in the Flood Insurance maps developed by FEMA and the County's ordinances, which are updated to comply with State and Federal regulations. The Flood Insurance Program was established by the National Flood Insurance Act of 1968 and provides previously unavailable flood insurance to property owners within delineated areas. The Act prohibits Federal financial assistance for construction projects within non-participating communities. Although Morgan County does participate in the program, concern has been expressed as to the accuracy of published Flood Insurance Program maps. The Federal Program is expected to update the maps at which time the County will provide details of existing flood control dams that may not have been considered in previous mapping of the Berkeley Springs area.

Due to nearly annual flooding in the Berkeley Springs area from Warm Spring Run, the Town of Bath in a joint effort with the Eastern Panhandle Soil Conservation District completed a watershed flood prevention and protection project in 1962. The project applied conservation land treatment measures to 2,200 acres, changed land use on 2,720 acres, stabilized four miles of critically eroding streambanks, and constructed eight single-purpose flood control dams. The eight dams were constructed upstream from the Town to control runoff of about 35% of the flood producing area. Prior to this project the area experienced severely damaging floods in 1936 and 1954. Since that time, however, the project has reduced flood occurrences to minimal impacts of sediment and debris being deposited into yards and occasional water back-up through sewer lines into basements.

In addition to the instance described above floodplain issues exist generally in three areas of the County. While less than 1% of the County land mass is covered by water, it does include a larger percentage covered by floodplain areas. These areas include the north south corridor of the Cacapon River, the much wider north south drainage area of Sleepy Creek, and the east west shore of the Potomac River. Although much of this land is under private ownership, community efforts and regulatory measures have achieved some positive influence in protecting these sensitive areas.

Some positive affects in protection of these sensitive environmental areas, especially adjacent to the many rivers and streams include promotion of riparian buffers through use of trees, shrubs and other vegetation. These buffers should be adequate in stabilizing banks, reducing erosion, and filtering sediments.

Wetlands

Wetlands are unique environments that are transitional areas between terrestrial and hydrological systems. As a component of both systems, they perform a variety of important functions and are in a state of constant change. Wetlands help maintain surface stream flow and groundwater recharge. They moderate stormwater runoff and downstream flood crests because they are natural water storage areas. Wetlands provide important habitat for many species of plant and animal life. They also serve as natural filters for reducing pollution of various chemicals and sediment into the waterways.

There are multiple problems with developing on wetland soils. Wetlands located in floodplains are often flooded. Draining or filling in of upland wetlands removes natural water storage, which yields increased water flows downstream. Wetland soils are sensitive in two ways. First, they are easily compacted, resulting in uneven settling of structures. Second, wetlands soils with low permeability and high groundwater tables are not suitable for the installation of on-lot septic systems due to the risk of surface and groundwater contamination. Wetlands are protected by the U.S. Army Corp of Engineers and the West Virginia Department of Environmental Protection.

Groundwater

Precipitation is the main source of groundwater recharge in Morgan County. Although precipitation is intermittent, water is continually moving from storage in the underground rock structures. In general, groundwater movement parallels the land surface, moving from ridges to the valleys, where it discharges into springs and streams.

Water is found in practically all rock formations of the Potomac River Basin, of which Morgan County is a part. However, the quantity of water largely depends on the kind, size and degree of interconnection of the openings in the rock, called fractures. The largest groundwater supplies are available from areas underlain by sandstone and limestone bedrock, which contains fractures and solutional cavities through which groundwater can easily move. The least water is available from shale, which contains very few openings of this type. Shale is more brittle than sandstone or limestone and at greater depths the weight of overlying rock squeezes openings shut.

There are two linear strips of land area on either side of Cacapon Mountain in which groundwater availability is reflected in well yields from 100 to 200 gallons per minute. These areas are coincident with predominately limestone and sandstone bedrock. The remaining areas of the County, which report lower well yields of 1 to 70 gallons per minute are mostly underlain by shale.

The most frequent groundwater quality problem in Morgan County is high mineral content. Groundwater beneath the ridges has a lower concentration of dissolved materials than beneath valleys because the ridges are mainly recharge areas and the valleys are mainly discharge areas. A well on a ridge draws relatively pure groundwater near the beginning of its flow path. A well in a valley draws comparatively impure groundwater, which is near the end of its flow path, has been exposed to bedrock longer, and has picked up dissolved materials along the way. Higher water quality exists among the ridges west of Cacapon Mountain than in the Sleepy Creek Valley to the east. The area east of Cacapon Mountain, where groundwater is characterized as having excessive iron content and hardness, is mostly underlain by shale. Because shale is not very permeable, water moves through it slowly creating the opportunity to dissolve more mineral matter.

The highest possibility of groundwater contamination from surface sources is in limestone areas because of the presence of solutional cavities and sinkholes; through which contaminated water can enter without being filtered through the soil mantle. This type of pollution is more frequently found in the Great Valley of which Berkeley and Jefferson Counties form a part. However, groundwater contamination is by no means limited to limestone areas. Studies in the Potomac River Basin have found high chloride concentrations in water from some wells tapping shale and sandstone near septic tanks and barnyards, indicating that the water may be polluted. Even so, in sparsely populated areas underlain by shale and sandstone, groundwater pollution does not appear to be a major problem.

Maintaining pure groundwater is important for the majority of Morgan County residents who rely on groundwater for drinking and domestic use. It is also important for industry and particularly for those enterprises, which rely on pure spring water such as the water bottling companies in Berkeley Springs, the Ridge State Fish Hatchery, and the baths of Berkeley Springs State Park.

Major Surface Water Bodies

Although there are no major surface water bodies in Morgan County, there are several minor lakes that range in size, and are primarily used for recreational purposes.

Cacapon State Park Lake is located within the 6,000 acre park and includes stocked fishing and non-motorized boating. It is fed by the local stream systems into an impoundment that covers more than 6 acres.

Lake Siri, a 13-acre, spring-fed lake is located between two green mountains adjacent to Coolfont's Treetop House. This private lake is well known for large big mouth bass fishing.

Water Source Protection Organizations

There are numerous residents and groups that recognize the importance of conserving and protecting the County's water resources. These individuals and organizations work to maintain watersheds, not only in Morgan County, but also throughout the region that impacts the Chesapeake Bay. Following is a brief list of some of these organizations.

- The Friends of Cacapon River serve as a resource to the community on issues affecting the Cacapon River watershed. They advocate the establishment of buffer areas along the river to support riparian plants that reduce runoff into the river. This is accomplished by educating land owners to the impact of altering riverbanks, encouraging developers, visitors, and landowners to participate in the stewardship of the river and its watershed and promoting active participation of area schools in developing student programs related to protecting their river. The group monitors activities in the lower Cacapon that could negatively impact the river.

- The Sleepy Creek Watershed Association was formed in July 2000. Its mission is to "protect and preserve Sleepy Creek and its watershed and to educate the community on the value of this precious natural resource in Morgan County, West Virginia."

- The Interstate Commission of the Potomac River Basin strives to enhance, protect, and conserve the water and associated land resources of the Potomac River basin and its tributaries through regional and interstate cooperation

- The Chesapeake Bay Foundation is a non-profit organization with a mission to improve the Chesapeake Bay watershed. It serves as a watchdog representing the Chesapeake conservation lobby to business, government, and public entities. It also actively restores native habitats and filtering mechanisms such as oyster beds, forests, and other riparian effects.

- The Soil and Water Conservation Society fosters the science of art and natural resource conservation

- The U.S. Fish and Wildlife Service works with others to conserve, protect, and enhance fish, wildlife, and plants in their habitats for continuing benefit of the public. The National Conservation Training Center is located on the banks of the Potomac River adjacent to Jefferson County.

- The West Virginia Rivers Coalition seeks conservation and restoration of West Virginia's exceptional rivers and streams. It has worked with the WV DEP to help improve public participation components of the NPDES.

- The Potomac Water Watch, supported by Friends of Cacapon River, serves the Potomac River Watershed and its tributaries and focuses on fish kills, intersex, emerging contaminants, and endocrinedistrupters.

- The Eastern Panhandle Conservation District is the local extension of the West Virginia Conservation Agency, which serves to conserve natural resources, control floods, prevent impairment of dams and reservoirs, assist in maintaining the navigability of rivers and harbors, conserve wildlife, protect the tax base, protect public lands and protect and promote the health, safety and general welfare of the people.

Sensitive Soils

Soil associations delineate where two or more soil types occur together in a characteristic pattern over a geographic region. Soil types are often combined because the scale of a map does not provide for easy individual delineation of soils. For this reason delineating soil associations is useful for general planning purposes, but is not suitable for site-specific analysis, unless additional site-specific analysis is conducted. Because soils within an association differ in slope, depth, stoniness, drainage and other characteristics, the actual location of physical improvements to property may differ from the general soils associations provided.

Soil Associations

The four major soil associations in Morgan County are classified by their suitability and limitations for various land uses. These limitations allow for flexibility as described above and are most notably measured by their appropriateness for septic systems and erosion control. These soil associations include; Huntington Weikart-Mononghela Association, Lehew-Berks-Dekalb Association, Berks-Litz-Weikert Association, and Dekalb-Laidig-Buchanan Association.

Huntington Weikart-Monongahela - consists of deep and shallow, well and moderately well-drained, medium-textured and moderately fine-textured soils of the floodplains shale uplands, and river terraces. Suitability for cropland is good and for woodland is mostly excellent to fair. There are severe limitations to permitting development in these areas with moderate limitations to roads due to the potential periodic flooding in lower areas.

Lehew-Berks-Dekalb - consists of moderately deep, well-drained, moderately coarse-textured and medium-textured soils of the uplands. Suitability for cropland is fair, though some soils are well suited to orchards. Suitability for woodlands is fair since dryness and low natural fertility cause severe seedling mortality. Limitations on development and roads are moderate primarily due to slope, limited depth to bedrock, and susceptibility to frost action.

Berks-Litz-Weikert - consists of moderately deep and shallow, well-drained, medium-textured, and moderately firm-textured soils of shale and siltstone hill uplands. Suitability for cropland is rated very poor and choice of crops is limited due to low water capacity. Suitability for woodland is poor since dryness and low natural fertility cause severe seedling mortality. Limitations to development and roads are moderate to severe due to steep slopes, limitations to bedrock, and susceptibility to frost.

Dekalb-Laidig-Buchanan - consists of moderately deep, well-drained and moderately well-drained, moderately coarse-textured to fine coarse-textured, mostly very stony soils of the uplands and colluvial slopes (slopes from which soil material, rock fragments, or both, have been moved by creep, slide, or local wash and deposited at the base). Suitability for cropland is very poor because soils are very stony and slopes are mostly steep to very steep. Suitability for woodland is mostly good to fair, although it is poor in dry areas, which create severe seedling mortality. Limitations to development and roads are mostly severe due to steep slopes.

Soil Limitations on Septic Systems

More specific than soil associations are the soil series and soil types within each series. Each soil type is rated according to agricultural productivity and according to properties which affect selected non-farm uses of land.

Chief among non-farm activities is the use of natural soil to renovate sewage effluent from septic drainage fields. The soil material between depths of 18" and 6' is evaluated for septic drain fields by means of a Soil Survey. The soils properties considered are those that affect absorption of effluent and construction and operation of the system. Properties that affect absorption are permeability (the quality that enables soil to transmit water and air), depth to water table or bedrock, and susceptibility to flooding. Slope is a soil property that affects difficulty of layout and construction as well as the risk of soil erosion, lateral seepage, and down-slope flow of effluent.

Limitations on the suitability of a particular soil for septic systems are expressed as slight, moderate, or severe. A rating of severe indicates the soil has serious limitations that are difficult, though not impossible to overcome. A review of all soil-mapping units in Morgan County indicates a severe limitation on the use of septic systems for all but less than 1% of the County's land area.

In practice, the suitability of soil for septic systems is determined on a site-by-site basis by the Morgan County Health Department based upon standards of the State Department of Health. On-site testing includes a percolation test to determine permeability and a 5' excavation to determine depth to bedrock and water table. The excavation must be inspected by the County Health Department Sanitarian to ensure that at least 5' of soil covers the bedrock and seasonal water table. This standard is interpreted liberally in Morgan County where thin layers of soil cover unconsolidated shale, which is often difficult to distinguish from bedrock.

The State Department of Health also sets standards for the use of septic systems to serve subdivisions of two or more lots, and which are less than 2 acres in size with an average frontage of less than 150'. Where a public water system is not available, each lot must be at least 20,000 square feet in area. A minimum 10,000 square foot disposal area must be set aside for installation of the initial absorption field, which includes enough area in reserve for additional absorption fields in case of failure of the initial installation. Disposal area may not be located on slopes exceeding 25%, nor within the limits of the 25-year floodplain. The latter standard has been difficult to evaluate since there is no current mapping of 25-year floodplains for Morgan County.

In 1980, nearly 66% or 2,974 housing units were utilizing septic systems. An additional 9% or 410 housing units were listed as “other”, including outhouses and no sewage disposal systems evident. Only 66 housing units remain without proper sewage systems evident many of which many are listed as seasonal housing. Given the location of many of these dwelling units along waterways and atop steeper slope areas, it is important to monitor both the continued use of these units as well as the transition of these types of units from seasonal use to year-round permanent occupancy.

The lack of adequate sewage disposal facilities usually comes to the attention of the Morgan County Health Department on a complaint basis. Many complaints involve structures without suitable methods of sewage disposal. The remaining complaints include systems in some degree of failure, generally evidenced by sewage coming to the surface of the ground. Methods to alleviate the impact of these issues include the use of either community or public sewerage systems or replacement with new septic systems.

It is well documented that septic systems which are properly installed following appropriate testing on environmentally suitable sites and which are regularly maintained will function properly for an indefinite period of time. Those septic systems within Morgan County that fail do so because of improper installation, poor soil conditions, high water table, or insufficiently sized soil absorption fields. In Morgan County the site evaluation and septic system installation steps allow for practices which may contribute to future septic system problems. The deficiencies identified include; allowing construction prior to site testing for optimum absorption and percolation testing that is only reported to rather than directly observed by the County Health Department.

Where existing septic systems fail and cannot be replaced, and where new sites are found to be unsuitable, alternative individual systems may be appropriate. State regulations allow for alternative sewage disposal systems which compensate for severe soil conditions under certain circumstances. These systems, which include sand mounds and other types of alternative methods are more costly than standard septic systems.

Soil Erosion

The major types of soil erosion in Morgan County are sheet and rill, streambank, and roadbank. Sheet and rill erosion occurs when water flows over a slope without a defined channel. It is a dominant erosive factor for cropland, pasture, surface mine spoils and refuse piles, and various construction activities. Sheet and rill erosion is accelerated by poor vegetative cover and steep topography.

Streambank erosion is the lateral recession of channel banks due to stream conditions. A stream which has not reached its load capacity will obtain sediment from the channel bottom and banks. Lack of channel bank vegetation increases streambank erosion.

Roadbank erosion results from sheet, rill, and gully erosion of the bank, and channel erosion in the adjoining ditch. Poor vegetation on the bank accelerates roadbank erosion.

Factors affecting soil erosion are the natural erodibility of the soil, slope, rainfall patterns, length of slope, and perhaps most importantly, land cover conditions. Compared to other areas in West Virginia, the Eastern Panhandle has soils with slight erodibility, a low rainfall climate, and gentle topography. However, erosion problems in Morgan County appear to be more severe than in the other two Panhandle counties. More than 20% of the land area in Morgan County is defined as having severely eroded soil.

Severely eroding areas were identified in the Comprehensive Survey of the Potomac River Basin prepared by the West Virginia Department of Natural Resources and the U.S. Department of Agriculture in 1981. Areas identified in Morgan County were streambank erosion along the Cacapon River, Sleepy Creek, Sir John's Run, and Warm Spring Run, and sheet and rill erosion from mining activity.

Other sources of sheet and rill erosion include farmlands and construction sites. The Agriculture Water Quality Management Plan outlined in the 1985 Plan, identified severely eroding farmlands in Morgan County, including 1,341 acres of cropland, 795 acres of permanent pasture, and 53,300 feet of farm roads. Construction sites for new housing and subdivision roads have also contributed to soil erosion in the County, especially where proper erosion control techniques have been neglected or ignored. Erosion from these activities has increased from an average of approximately 10 tons per year as development has increased. This has also increased the previous estimate of 100 tons per year under extreme conditions.

Air Quality

The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the U.S. EPA is responsible for setting standards, also know as national ambient air quality standards (NAAQS), for pollutants such as mercury from coal fired electric generating plants to the west, which are considered harmful to people and the environment. These pollutants also include ozone, particulate matter, sulfur dioxide, carbon monoxide, and nitrogen dioxide. The major sources of these pollutants are cars, power plants, and heavy industry. The EPA is also responsible for ensuring that these air quality standards are attained through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources.

The EPA Air Quality Index (AQI) reports on levels of the NAAQS pollutants present in the air. An AQI value is given for each monitoring site and pollutant. The overall AQI for a site is the highest index value of any of the pollutants. Exposure to these pollutants can make it difficult for some people to breathe, especially people with asthma and other respiratory problems. As the level of any of these air pollutants rises beyond health standards, precautionary health warnings are triggered.

In 2003, the West Virginia Department of Air Quality (DAQ) identified the Eastern Panhandle counties of Jefferson and Berkeley as potential non-attainment areas. The counties voluntarily entered into an Early Action Compact which required areas to identify and implement control strategies earlier than would otherwise be required. This is similar to actions being taken by other

neighboring counties in neighboring states. Although Morgan County has not been identified at this time as a potential non-attainment area, it is important to remain aware of the effect such regulations may have on future growth within the County and surrounding region.

Forest Resources

Forest resources in Morgan County are valuable in several respects. They provide an attractive and healthy environment for many recreational activities such as camping and hiking, around which many public and private recreational and tourism features in the County are established. Forests provide the necessary habitat for wildlife to thrive. It is also superior to both developed and agricultural land in controlling storm water runoff, which is essential to the natural management of the watersheds.

Based on inventories conducted by the U.S. Geological Survey in 1975, there were 121,650 acres of forest in Morgan County, which made up more than 80% of the total County land mass. Of this total, there were nearly 7,000 acres of non-commercial and 114,000 acres of commercial forestland. Commercial forestland is that which is producing or capable of producing crops for industrial wood which is not withdrawn from timber utilization. A comparison of the 1975 and 1980 aerial photographs indicated further areas of early growth forests on land previously devoted to agricultural use, especially in the Sleepy Creek and Central Valley planning regions. By 2000 the total forested areas within the County decreased by merely 1% to 79% or 117,000 acres, and out of approximately 1,130 acres harvested per year, it is estimated that only 130 acres is clear cut for development and agricultural uses.

While forest areas have increased at the expense of active cropland in the areas east of Cacapon Mountain, forestland has continued to be lost to both permanent and seasonal housing, especially in the southern areas of the Central Valley region. Larger residential subdivisions have cleared forestland for access roads, which has divided forests and created erosion problems.

As losses due to development pressure have continued to increase, the number and funding of various state and federal programs has also increased. One such program that may affect Morgan County in the near future is the U.S. Forest Service's Forest Legacy Program. This program currently includes in its 2006 budget, a total of $1.8 million for the Potomac River Hills project. Funding of this project would allow the West Virginia Division of Forestry to acquire a conservation easement on a 2,400 acre tract of land owned by The Conservation Fund, for the purpose of protecting sensitive lands on Sideling Hill in the Potomac River watershed. This would add a significant boost to the current 194 acres under similar preservation programs.

From a commercial standpoint, most woodland in Morgan County is considered of low productivity, more suitable for pulpwood than for saw timber. The Oak Site Index for Morgan County soil averages from 45 to 60. This index is the average height, in feet, of a well-stocked oak stand 50 years of age. More than 110,000 acres of the County's land area is classified as having an Oak Stand Index of 65 or less.

There are 32 active tree farms in Morgan County that are certified by the American Tree Farm System. These farms account for the majority of commercial harvesting, and include several Christmas tree farms. However, there are just over 20 people employed in Morgan County in this industry.

Christmas tree production offers significant potential for commercial development. In 1980 there were approximately 12 Christmas tree growers with 2 or more acres of production, accounting for a total of nearly 100 acres. As of 2000 that acreage had increased to more than 100 acres. The Soils Survey indicates that over 70,000 acres in the County are suitable for Christmas tree growing.

There are 3 active sawmills in Morgan County, which purchase stumpage and sawlogs of mixed hardwoods and produce lumber, railroad ties, and pallets. This includes one on Poole Road and another on Gloyd Lane. The third sawmill, located on Pious Ridge did not operate in 2005.

Mineral Resources

The predominant bedrock in the County consists of various types of shale. They outcrop on long narrow bands on both sides of Cacapon Mountain and are also exposed by erosion on the summit of the Mountain. The USGS Survey indicates that some of these shales may be adaptable to brick manufacture but careful testing would be required to prove the different locations best suited to this endeavor. Also, given the change in environmental regulations, most sites may prove both cost prohibitive and detrimental to preserving the County's quality of life.

Limestone outcrops are present along the east side of Tonoloway Ridge and the upper west slope of Warm Spring Ridge. This limestone was once quarried and crushed at a small plant on the west slope of Warm Spring Ridge near Berkeley Springs. It made good quality lime and also excellent road material. The USGS Survey indicates several places along Warm Spring Ridge where this stone could produce a large tonnage.

The most important glass-sand district in West Virginia is near Berkeley Springs where the Oriskany Sandstone is quarried. This sandstone outcrops on a number of ridges in Morgan County, being usually much iron stained, impure and often quite hard. However, in Warm Spring Ridge it is a snow-white crumbly sandstone especially adapted to use as glass sand and, through subsidiary companies, attapulgate clay. Corporate headquarters are located near the surface mine north of Berkeley Springs. The company's existing mine, and additional land holdings total 2,786 acres in Morgan County.

The Baird Field is a small area of gas production in western Morgan County. Two producing gas wells were completed in 1967 in an area just west of Hansrote and since that time additional wells have been completed. These wells are listed by the USGS Survey as producing 800,000 to 1.2 million cubic feet per day at depths of more than 4,800 feet in some places.

Unlike most of West Virginia, Morgan County has very limited potential for coal production. Coal stems on Sideling Hill are quite thin and the coal is high in ash and very crumbly on

exposure. Small mines were once opened to supply a small local trade, but even these did not produce enough to continue operations. Coal deposits of the Meadow Branch Field now lie within the Sleepy Creek Public Hunting Area. These deposits are in thicker veins than the Sideling Hill and are of very good quality except for a close admixture of slate.

Agricultural Resources

Agriculture is the second largest land use with nearly 23,000 acres or roughly 16% of the County area. Beef cattle, horses, hay, corn, wheat, and pasture are the principal products. About 250 acres remain in apple and peach orchards. Vegetable production is increasing due to a strong local demand for fresh produce and the close proximity to the Washington D.C. market. The number of farms with horses has also been increasing steadily.

There are approximately 800 agricultural tracts being farmed by 178 agricultural producers. The average tract size is 129 acres with most producers farming several rented tracts to create an economically viable unit. The 2002 Census of Agriculture lists 84 full time farmers in the County. There is 9,500 acres of cropland including annually produced commodity crops and forage corps in rotation. Another 9,000 acres is used for pasture for livestock with the remaining acreage used for farm buildings, barnyards, or idle land. Farm woodlots cover an additional 9,600 acres. Many of the farm tracts are owned by part time residents and are leased to residents that farm full or part time.

Soils in Morgan County farmland vary from thin, droughty shales on ridges tops to rich, deep floodplains and terrace soils. Seasonal high water tables are common on ridge tops and at the base of slopes. The shallow shale soils are moderately productive for forage crops although soil amendments are required to maximize production. The Morgan County Soil Survey published in 2006 shows 6,630 acres of prime farmland. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops. Soils on 7,758 acres have been identified as soils of statewide importance. Generally, this land nearly meets the requirements for prime farmland and can economically produce high yields of crops; however additional management must be utilized because of landscape position or some other limiting factor. An additional 56,540 acres has been designated as locally important farmland by the Morgan County Commission. This designation was made at the request of the Morgan County Farmland Preservation Board with concurrence by the USDA Natural Resources Conservation Service (NRCS) and includes soils that are generally used as pasture and hayland in the Eastern Panhandle of West Virginia.

The Morgan County Farmland Protection Program was established on December 2, 2002 under the authority granted to the Morgan County Commission by WV Code 8A-12. The Morgan County Farmland Protection Board administers the program, which is designed to hold permanent easements that prevent further subdivision of property and prohibit uses of the property that are incompatible with agricultural enterprise. The program goal is to preserve prime and important farmland, encourage stewardship of natural resources, and protect the historical

and scenic features of the County. The program is funded through property transfer fees and matching grants from NRCS. Currently five farms have committed to permanent agricultural easements with these easements completed totaling 719 acres.

Agriculture as a viable land use is increasingly under pressure by adjoining residential development of rural land. The loss of open space forces farmers to utilize marginal lands, which generally are more erodible, droughty, less productive, and cannot be easily cultivated. Residential development in close proximity to agriculture raises the concerns of incompatible land use resulting from dust, livestock and livestock waste, and the presence of chemicals typically used by farmers in the production of crops.

Local residents and organizations recognize and support the agricultural industry in Morgan County for its contribution to the nature and character of the community. The following are some of the groups that provide assistance and services to farmers:

- Morgan County Farm Bureau
- Eastern Panhandle Conservation District
- Morgan County Fair Board
- Morgan County Farmers Market
- Potomac Headwater Resource Conservation and Development Council
- WV Cooperative Extension
- WV University Davis College of Agriculture
- WV Department of Agriculture
- WV Conservation Agency
- USDA Farm Service Agency
- USDA Natural Resource Conservation Agency

Rare & Endangered Species

Morgan County's rare plant and animal species are found in the Sleepy Creek and Cacapon River watersheds. This is also where the County's only endangered species continues to survive. Through the help of such groups as the Sleepy Creek Watershed Association and Friends of Cacapon River, both protection and education of this sensitive environment remains a priority in dealing with the pressures of increased development.

The Sleepy Creek watershed is home to 23 rare plant and animal species as well as one endangered flower species. These rare species have been monitored by the West Virginia Department of Natural Resources over the past several years, and additional measures have been taken to protect the endangered wood turtle, which is found in only eight counties throughout the State. The endangered wildflower; Harperella also manages to survive in these watersheds which are one of only ten known populations of this species between Alabama and Maine.

Table 6-1 Rare and Endangered Species

Scientific Name	District	Common Name	2004 Sighting
Acris crepitans crepitans	Sleepy Creek	Eastern Cricket Frog	2
Catocola herodius gerhardi	Sleepy Creek	Pine Barrens Underwing	1
Coragyps atratus	Sleepy Creek	Black Vulture	3
Coreopsis verticillata	Sleepy Creek	Whorled Coreopsis	2
Euchlaena milnei	Sleepy Creek	A Looper Moth	2
Glyceria laxa	Sleepy Creek	Northern Manna Grass	1
Glyptemys insculpta	Sleepy Creek	Wood Turtle	6
Heterodon platirhinos	Sleepy Creek	Eastern Hog Nosed Snake	3
Liparis loeselii	Sleepy Creek	Loesel's Twayblade	2
Neotoma magister	Sleepy Creek	Allegheny Woodrat	2
Oenothera argillicola	Sleepy Creek	Shale Barren Evening Primrose	2
Pandion haliaetus	Sleepy Creek	Osprey	1
Piptochaetium	Sleepy Creek	Blackseed Needlegrass	1
Potamogeton pulcher	Sleepy Creek	Spotted Pondweed	1
Pseudacris triseriata feriarum	Sleepy Creek	Upland Chorus Frog	1
Pseudotriton ruber	Sleepy Creek	Northern Red Salamander	1
Ptilimnium fluviatile	Sleepy Creek	Harperella	1
Pycnanthemum muticum	Sleepy Creek	Blunt-Mountain Mint	1
Schoenoplectus purshianus	Sleepy Creek	Weakstalk Bulrush	1
Solidago arguta var harrisii	Sleepy Creek	Shale Barren Goldenrod	2
Sorex hoyi winnemana	Sleepy Creek	Southern Pygmy Shrew	2
Sylvilagus obscurus	Sleepy Creek	Appalachian Cottontail	1
Veronica scutellata	Sleepy Creek	Marsh Speedwell	1

Source: Sleepy Creek Watershed Association

Although not rare, it is also home to at least eight species of mussels, which are typically more prevalent near the confluence of the Potomac River.

Goals & Objectives

The natural environment and the physical factors affecting it are important to the local quality of life and the local economy. If new development is most efficiently concentrated around existing population centers which provide basic public service and infrastructure, development can occur in the most cost-effective way, while preserving the rural open space, and sensitive areas. Unplanned growth, loss of farmland and open space, and subdivision of rural land, are among the top concerns for Morgan County residents. Since preventive measures to protect the environment are preferable to corrective measures, this Plan should accentuate goals and objectives which will prevent scattered sprawl in the rural areas, loss of open space, and degradation of the environment.

Goals

The main goals concerning natural resources focus on protecting sensitive areas and the wise use of land. They include:

- Encouraging reduction of the contamination of ground water and protection of the recharge areas for the natural springs in the Town of Bath;
- Protecting rivers and streams and the Chesapeake Bay watershed by promoting riparian buffer zones and minimizing the impact of runoff and erosion on stream systems; and
- Working to protect and limit growth in sensitive areas such as those containing steep slopes, prime agricultural soils, flood plains and waterways, or endangered species of flora and fauna.

Objectives

Accomplishing the following objectives will ensure progress toward these goals:

- Promoting best resource management practices in farming, including riparian buffers, native landscaping, and forest management techniques;
- Encouraging landowners to preserve land along waterways by committing these areas to land trusts, and to protect farmlands and woodlands through agricultural and preservation easements;
- Participating in the development of programs to curtail erosion and limit the release of sediment and nutrients into streams, and increase public awareness of this issue;
- Supporting implementation of the strategies of the Morgan County Water Resource Study;
- Encouraging maintenance of the National Floodplain Insurance Program 100 year floodplain mapping to reflect more recent knowledge of the designated areas, and promote enforcement of the regulations regarding use of these areas;
- Promoting protection of groundwater by directing residential and commercial development away from recharge areas;
- Supporting programs to educate the public about responsible care of the county's natural areas that serve as natural passive and active open space;
- Encouraging development of a long term park, recreation, and environmental resource protection plan focusing on areas where there is increasing development pressure; and
- Preparing to react to the Air Quality Early Action Compact.

Morgan County, West Virginia
Comprehensive Plan
- Emergency Services Map -

0 5,000 10,000 20,000 30,000 Feet

Roads
Major Roads
Streams
Towns
County Boundary
Health Departments
Hospitals
Police Departments
Fire Departments

MARYLAND

See Paw Paw Inset

HAMPSHIRE CO, WEST VIRGINIA

Great Cacapon VFD

MARYLAND

See Berkeley Springs Inset

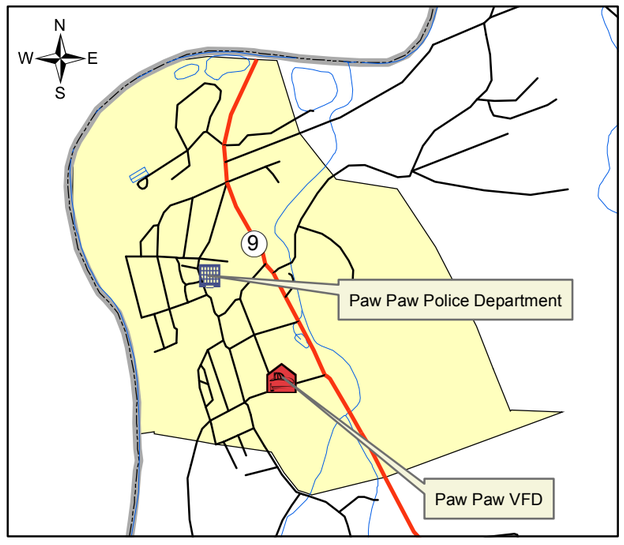
Morgan Co. Rescue Squad

State Police
Berkeley Springs

South Morgan VFD

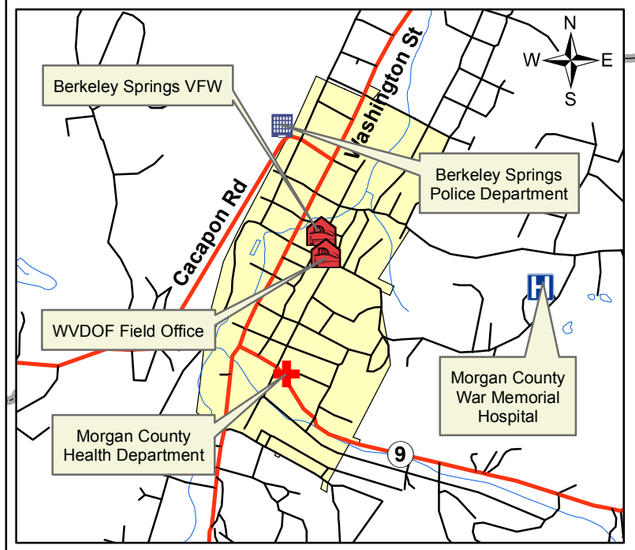
BERKELEY CO, WEST VIRGINIA

Paw Paw Inset



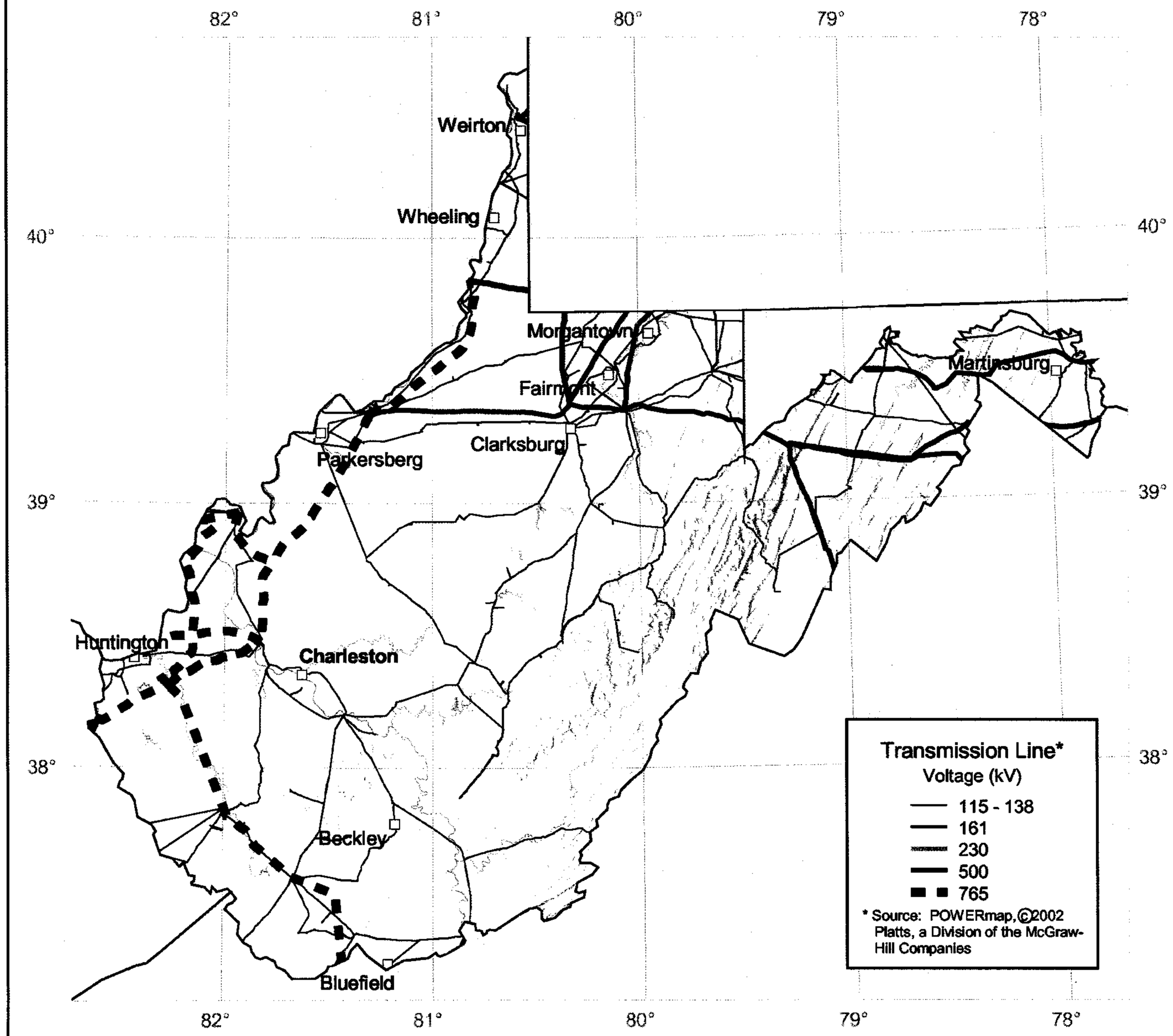
0 500 1,000 2,000 3,000 4,000 5,000 Feet

Berkeley Springs Inset



0 500 1,000 2,000 3,000 4,000 5,000 Feet

West Virginia - 50 m Wind Resource Map



Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed [a] at 50 m m/s	Wind Speed [a] at 50 m mph
1	Poor	0 - 200	0.0 - 5.6	0.0 - 12.5
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	> 800	> 8.8	> 19.7

[a] Wind speeds are based on a Weibull k value of 2.0

The annual wind power estimates for this map were produced by TrueWind Solutions using their Mesomap system and historical weather data. It has been validated with available surface data by NREL and wind energy meteorological consultants.

U.S. Department of Energy
National Renewable Energy Laboratory

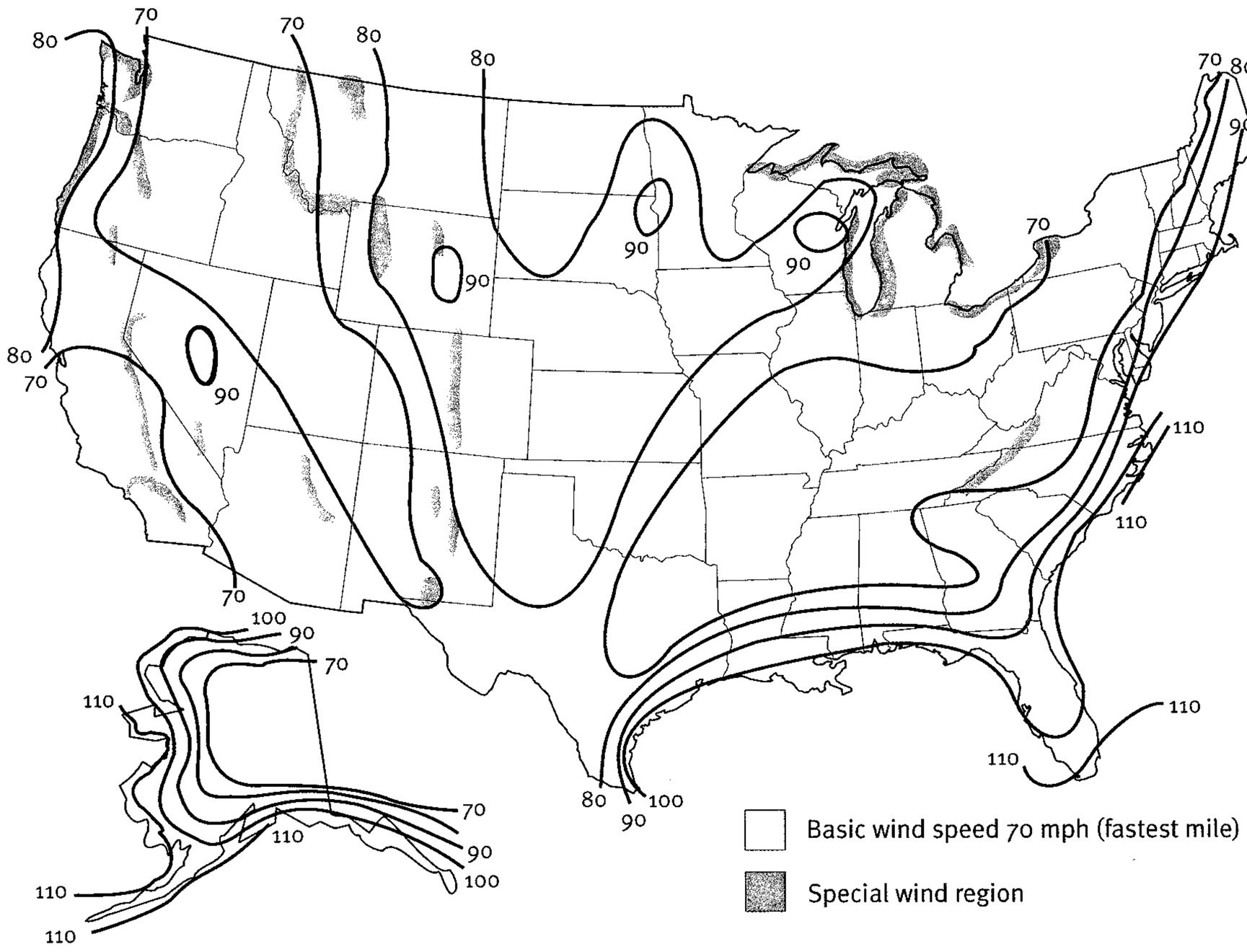
NREL

12-JAN-2003 1.1.1

Appendix R

Wind Loads

The southeast coast of the United States is prone to tropical storms and hurricanes. Foundation design and selection in these areas often is subject to local code wind speed minimums (see **Figure 2.5**). Where hurricanes are common, the selection of a foundation system must take into consideration its ability to hold a home down in hurricane winds.



NOTES:

1. Values are fastest-mile speeds at 33 ft. (10m) above ground for exposure category C and are associated with an annual probability of 0.02.
2. Linear interpolation between wind speed contours is acceptable.
3. Caution in the use of wind speed contours in mountainous regions of Alaska is advised.
4. The ASCE 7-98, 2000, at Figure 6-1, shows wind speed values as 3-second gusts, with a revised map.

SOURCE: *ASCE 7-88, 1990, American Society of Civil Engineers - Minimum Design Loads for Buildings and Other Structures, Fig.1, Basic Wind Speed (mph).*

Figure 2.5 Basic Wind Speed Map (fastest wind speed, mph)

Appendix R

Morgan County, West Virginia
Comprehensive Plan
- Geology Map -

MARYLAND

See Paw Paw Inset

HAMPSHIRE CO, WEST VIRGINIA

MARYLAND

See Berkeley Springs Inset

VIRGINIA

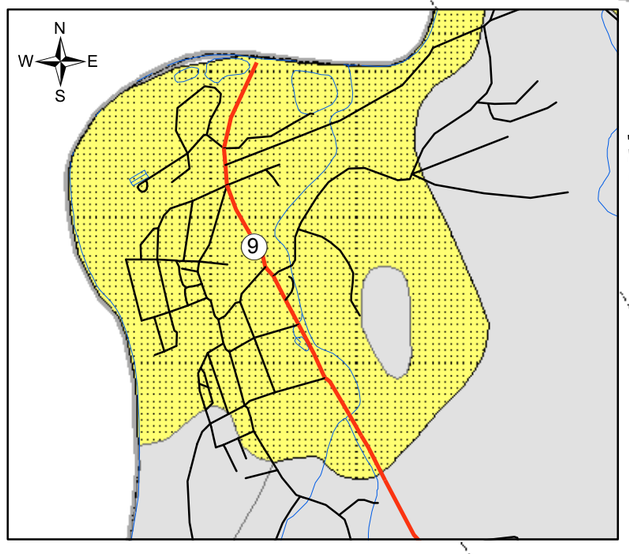
VIRGINIA

BERKELEY CO, WEST VIRGINIA

0 5,000 10,000 20,000 30,000 Feet

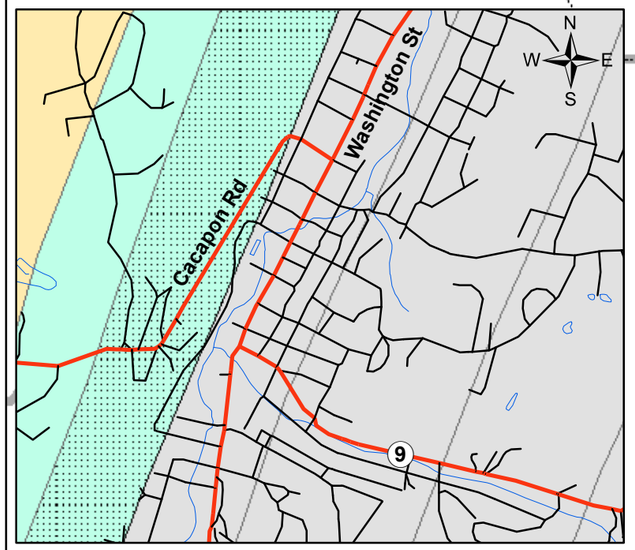
- Roads
- Major Roads
- Streams
- Towns
- County Boundary
- Alluvium
- Limestone
- Sandstone
- Shale
- Sandstone / Limestone

Paw Paw Inset



0 500 1,000 2,000 3,000 4,000 5,000 Feet

Berkeley Springs Inset



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ARRO
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